



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Kathleen Clarke
Executive Director

Lowell P. Braxton
Division Director

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February 26, 2001

Dave Miller, Resident Agent
Lodestar Energy, Inc.
HC 35 Box 380
Helper, Utah 84526

Re: Approval of Application to Permit a Portion of Lease UTU-74804, Lodestar Energy Inc.,
Horizon Mine C/007/020-SR00B, Outgoing File

Dear
Dear Mr. Miller:

The Division has reviewed the Permit Application Package (PAP) which was submitted to add a portion of the Beaver Creek Federal Lease (UTU-74804) to the Horizon Mine. We have determined that the PAP adequately meets the technical requirements of the Utah program which have been delegated by the OSM/Utah Cooperative Agreement. Based upon the entire record, the Division finds the PAP to be in compliance with the Program and state law and regulations (Article VI. Section C.4.(b)). Your application to permit the portion of federal lease UTU-74804 south of Beaver Creek is hereby approved.

This letter, the Technical Analysis, the Division's Written Findings, the Cumulative Hydrologic Impact Assessment, and the information required by Section 510 (c) constitute the state decision package under Article VI Section C.4.(e), which will be forwarded to OSM in accordance with the Cooperative Agreement for OSM's review and action in accordance with Article VI of the Cooperative Agreement. A copy is enclosed for your records.

Before Lodestar Energy, Inc. may conduct coal development or mining operations on the Federal lease, it must obtain Secretarial approval of the mining plan. Before issuance of the permit Lodestar must post an acceptable reclamation surety with the Division. The Division reserves the right to amend or rescind any requirements of the permit to conform with any terms or conditions imposed by the Secretary in the approval of the mining plan. Thank you for your cooperation during the permitting process. If you have any questions, please call me.

Sincerely,

Lowell P. Braxton
Lowell P. Braxton
Director

drh/sm

Enclosures:

cc: James Fulton, OSM
Richard Manus, BLM w/o
James Kohler, BLM w/o
Mark Page, Water Rights w/o
Dave Ariotti, DEQ w/o
Derris Jones, DWR w/o
Price Field Office

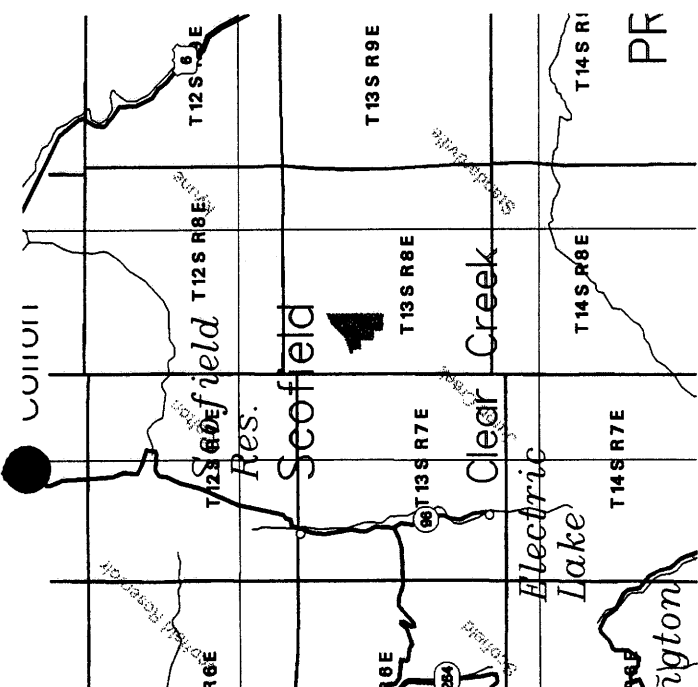
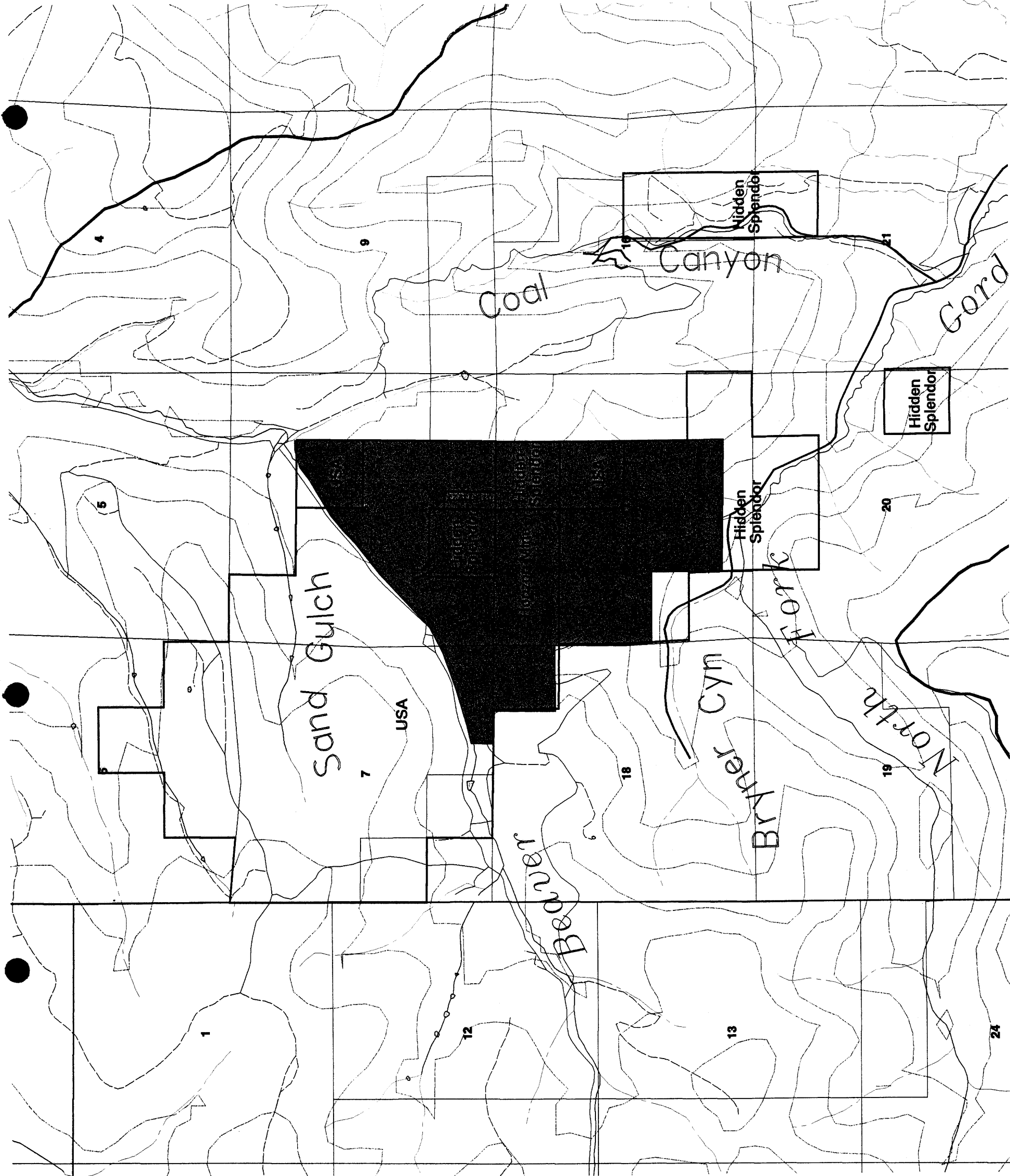
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**UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION DOCUMENT AND
TECHNICAL ANALYSIS**

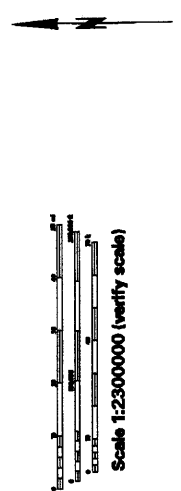
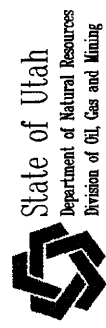
Lodestar Energy Inc.
HORIZON MINE
C/007/020
Carbon County, Utah
February 26, 2001

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 - Record of Decision/Finding of No Significant Impact
 - Coal Lease UTU-74804



Location Map



Location Map Horizon Mine	
TOPOGRAPHIC MAP	
File: horizmap.gra	
Compiled by: Dan Smith	Date: February 21, 2001

ADMINISTRATIVE OVERVIEW

Horizon Coal Corporation

HORIZON MINE

C/007/020

Carbon County, Utah

February 26, 2001

Background

The Horizon Mine is located in Consumers Canyon approximately 13 miles northwest of Price. A variety of coal mining activities occurred between 1921 and 1952 in the vicinity of the Horizon Coal Mine area. Several mines extracted coal from two coal seams, the Castlegate "A" and the Hiawatha seams.

C and W Mining Company submitted a permit application for these mines in 1982, but a bond was never posted, and therefore, a permit never issued. The Blue Blaze Coal Company submitted a permit application for the Blue Blaze Coal Mine in March 1989. The permitting process proceeded for three years, whereupon the Division was prepared to issue a permit with ten stipulations on May 29, 1992. However, a bond was never posted and thus the permit was never issued to Blue Blaze.

On March 29, 1995 the Division was notified that the permit application PRO/007/020 had been assigned by Blue Blaze Coal Company to Horizon Coal Corporation. Horizon then proceeded to revise and update the application in the pursuit of a permit to mine coal. Horizon submitted an application on May 2, 1995 and a permit was issued on October 10, 1996 which authorized mining on approximately 317 acres of primarily fee lease (17 acres in a BLM Right-of-Way). The surface disturbed area consists of 9.15 acres and contains the typical support facilities for a small underground mine (i.e.: portals, fan, office, shop, supply and bath trailers, conveyors, pad and stockpile areas). The permit was transferred to Horizon Mining, LLC on November 6, 1997 and then to Lodestar Energy, Inc. on July 14, 1999. The need for additional lease acreage soon became apparent and Horizon Mining, LLC acquired the Beaver Creek Federal Lease on September 1, 1998 through the Lease By Application (LBA) process. This lease was acquired by Lodestar Energy, Inc. as part of its asset purchase from Horizon LLC, dated July 14, 1999. Lodestar has now applied to permit a portion of the Beaver Creek Coal Lease.

Description of the Proposal

Lodestar Energy, Inc. has applied to permit 406 acres of the 1288 acre federal lease. Only a portion of the lease (area south of Beaver Creek) is being permitted since adequate baseline hydrologic data have not been collected as yet for the area north of Beaver Creek. The addition of a portion of this federal lease will be an underground extension of the existing Horizon mine. No additional surface disturbances are planned. The mine will continue to be a room and pillar operation. The permit boundary contains 711 acres, 406 acres of federal lease and the remaining

305 acres are fee lease. Mining will be done entirely in the Hiawatha seam commencing at a rate of 360,000 tons per year and increasing to a rate of from 700,000 tons to 1.5 million tons per year. The lease extension is estimated to contain approximately 1.3 million tons of recoverable coal.

While this permit application is for 711 acres, Lodestar has indicated the intention of permitting the remainder of the federal lease once adequate baseline hydrologic data has been collected.

Recommendation for Approval

This recommendation for approval is based on the complete permit application package (PAP), the Technical Analysis (TA) conducted by the Division, the Cumulative Hydrologic Impact Assessment CHIA also prepared by the Division, the approval of the R2P2 by the BLM, and the administrative record. Lodestar Energy, Inc. has demonstrated that mining within the permit boundary can be done in conformance with the Surface Mining Control and Reclamation Act, and the corresponding Utah Act and performance standards. The 510 (c) report on the Applicant Violator System for this mine has an issue recommendation.

It is recommended that approval be given for the Beaver Creek Lease Application. Issuance of the permit is contingent upon Lodestar Energy, Inc. posting the required bond in the form required by the Division.

PERMITTING CHRONOLOGY

Lodestar Energy, Inc.
Beaver Creek Lease
Horizon Mine
C/007/020
Carbon County, Utah
February 26, 2001

March 15, 2000	Lodestar Energy, Inc. submits the permit application package for the addition of Lease UTU-74804 to the Horizon Mine.
May 8, 2000	The application was determined to be incomplete and was returned to Lodestar.
August 21, 2000	Lodestar Energy, Inc. resubmits the revised permit application for adding a portion of lease UTU-74804 to the Horizon mine.
October 23, 2000	The permit application was determined to be administratively complete which initiated the technical review and public participation process.
October 26, 2000	The Division sent letters to state, federal and local planning agencies about the complete permit application. Additionally, permit application packages were sent to appropriate federal and state agencies.
October 31 and November 7, 14, 21, 2000	This permitting action, intent to expand the Horizon mine into part of the Beaver Creek Lease, is published in the <u>Sun Advocate</u> , for four consecutive weeks.
December 11, 2000	SHPO concurs with the report's recommendation that <u>No Historic Properties</u> will be impacted within the Beaver Creek Lease addition to the Horizon Mine.
December 13, 2000	The Division completes a technical review of the application and forwards a copy to Lodestar Energy, Inc. The review identifies deficiencies that must be corrected.
December 21, 2000	30-day comment period ends. No comments received.

December 21, 2000,
& January 11, 2001

Lodestar Energy, Inc. submits additional information to the Division which addresses the previously identified deficiencies.

February 9, 2001

Lodestar provides a copy of the revised and approved R2P2 recommendation to the Division

February 16, 2001

AVS check completed with issue recommendation

February 22, 2001

Section (7) consultation is completed by Fish and Wildlife Service

February 26, 2001

Division completes the Technical Analysis and Cumulative Hydrologic Impact Assessment, The Division's Decision Document is completed and application is approved. Issuance of a revised permit will be contingent upon Lodestar posting the appropriate bond.

MINING PLAN INFORMATION

Mine Horizon #1 & No.2 County: Carbon
 Permit ID ACT/007/020 () New (X) Revision ID SR00B
 Permittee Lodestar Energy, Inc.
 Address HC 35, P.O. Box 370, Helper, Utah 84526 Phone: (435) 448-9454
 Official & Title David B. Miller - Resident Agent

Proposed Operations

Federal Lease(s) Addition of UTU-74804 Beaver Creek Tract

() Surface (X) U/G Mining Method(s) Room & Pillar W/Continuous Miner

Coal Seam(s) to be Mined:

<u>Seam Name</u>	<u>Coal Thickness(es)</u>	<u>Seam Depth</u>
<u>Hiawatha</u>	<u>5 to 8 feet</u>	<u>200 to 1500 feet (~700 feet ave.)</u>

<u>Surface Ownership</u> (Acres)	<u>Existing</u> <u>Permitted Area</u>	<u>Proposed</u> <u>Permitted Area</u>	<u>Total Mine</u> <u>Permitted Area</u>
Federal	<u>17.5*</u>	<u>406</u>	<u>406</u>
Non-Federal	<u>305</u>	<u></u>	<u>305</u>

Coal Ownership (Acres)

Federal Lease(s)	<u>0</u>	<u>406</u>	<u>406</u>
Unleased Federal (Row)	<u>17.5 *</u>	<u></u>	<u></u>
Non-Federal	<u>305</u>	<u></u>	<u>305</u>

TOTAL Acres	<u>317.5</u>	<u>406</u>	<u>711</u>
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Disturbed Acres	<u>9.15</u>	<u>0</u>	<u>9.15</u>
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Mineable Coal (Tons)

Federal	<u>0</u>	<u>2,100,000</u>	<u>2,100,000</u>
Non-Federal	<u>1,300,000</u>	<u>0</u>	<u>1,300,000</u>
TOTAL Tons	<u>1,300,000</u>	<u>2,100,000</u>	<u>3,400,000</u>

Recoverable Coal (Tons based on 60% recovery)

Federal	<u>0</u>	<u>1,300,000</u>	<u>1,300,000</u>
Non-Federal	<u>800,000</u>	<u>0</u>	<u>800,000</u>

TOTAL Tons

800,000

1,300,000

2,100,000

Ave Annual Production: starting at 360,000 tons then increasing to 700,000 to 1,500,000 tons

Year Mining Ends *

- * The initial permit for this mine included 17.5 acres which were part of a BLM right-of-way which was needed to access fee coal. This right-of-way was absorbed into the Beaver Creek Lease and is now part of the lease. Only a portion of the Beaver Creek Lease (406 acres) is being permitted with this action. The permittee intends on permitting the remaining 874 acres of the Beaver Creek federal lease in the near future which will extend the life of the mine by a number of years. This will require a new permitting action.

Federal

FINDINGS

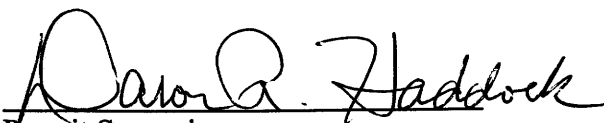
Lodestar Energy, Inc.
Horizon Mine
C/007/020
Carbon County, Utah
February 26, 2001

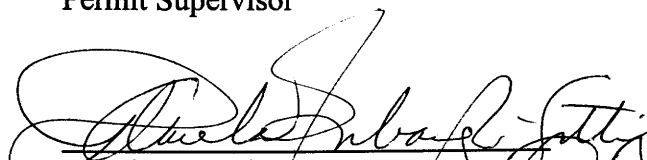
1. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with. See Affidavit of Publication in Appendix 2-2 of PAP. (R645-300-120)
2. The permit application for the extraction of coal from the Beaver Creek Federal Lease (U-74804) using the associated surface facilities for the Horizon Mine is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") have been complied with. See Technical Analysis dated February 23, 2001 (R645-300-133.100)
3. The proposed lands to be included within the permit area are:
 - a. Not included within an area designated unsuitable for underground coal mining operation (R645-300-133.220);
 - b. not within an area under study for designated land unsuitable for underground coal mining operations (R645-300-133.210);
 - c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);
 - d. not within 100 feet of a public road except where the Consumer's Canyon road overlies a portion of the Beaver Creek Lease near the south west boundary of the lease. In this case the road will be protected since, mining is not proposed to occur beneath the road. (R645-300-133.220); and
 - e. not within 300 feet of any occupied dwelling (R645-300-133.220).
4. The applicant has the legal right to enter and complete mining activities in the Beaver Creek Tract through the federal coal lease issued by the Bureau of Land Management. (See verification of leases in Appendix 2-3, in PAP and lease document attached) (R645-300-133.300)
5. An assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been conducted by the Division and no significant impacts were identified. See CHIA dated February 23, 2001. The


Mining and Reclamation Plan (MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas. (R645-300-133.400 and UCA 40-10-11 (2)(c))

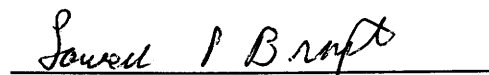
6. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. See Technical Analysis dated February 23, 2001 and letter from the Fish and Wildlife Service dated February 22, 2001. (16 USC 1531 et seq.) (R645-300-133.500)
7. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis dated February 23, 2001 and letter from the Governor's Office of Planning and Budget determining no historic properties affected, dated December 11, 2000. (R645-300-133.600)
8. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasibly accomplished following the approved plan as outlined in the PAP. See Technical Analysis dated February 23, 2001. (R645-300-133.710)
9. The applicant has demonstrated that all mine facilities and structures will comply with the applicable performance standards of R645-301. No special categories of mining are proposed so the R645-302 regulations do not apply. Addition of the federal lease will not change the surface facilities being used at the mine. (R645-300-133.720 R645-300-133.740)
10. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither Lodestar Energy, Inc. or any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (A 510 (c) report was run on February 16, 2001, see memo to file dated February 20, 2001). (R645-300-133.730)
11. The proposed postmining land-use of the permit area will remain the same as the pre-mining land use.(R645-300-133.750)
12. The applicant has posted a surety bond for the Horizon Mine payable only to the Division of Oil, Gas and Mining in the amount of \$711,000, however since this action now involves federal lands, the bond must be revised to make it payable to the Office of Surface Mining as well as the Utah Division of Oil Gas and Mining. This must be accomplished prior to issuance of the permit. (Frontier Insurance Company, Surety Number 21-60-38 dated March 19, 1999) (R645-300-134)

13. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See January 23, 2001 Technical Analysis (R645-302-313.100 and R645-302-321.100)
14. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.

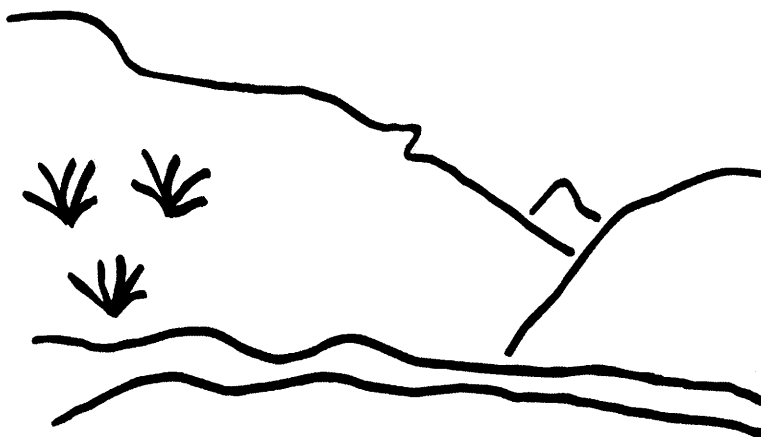

Permit Supervisor


Permit Supervisor


Associate Director of Mining


Director

State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Horizon Mine
Beaver Creek Tract Lease Addition #UTU-74804
C/007/020- SR00B-1
Technical Analysis
February 23, 2001

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TECHNICAL ANALYSIS

INTRODUCTION

On August 21, 2000 Lodestar Energy, Inc., submitted a proposal to expand underground mining operations in Horizon Mine. According to R645-303-224.100 the proposed expansion is considered a significant revision (SR) since the permit change increases the subsurface operations 15 percent, or greater, of the current permit area. The SR will add approximately 711 acres to the current permit area identified in the approved MRP. Division determined the SR to be Administratively Complete on 10/26/00. The technical analysis containing 12 minor deficiencies were sent to the applicant on December 12, 2000. The applicant's response to the technical analysis was received by the Division on December 21,

This technical analysis review evaluates the technical completeness issues of the SR. The SR expands coal mining operations north, in the Fish Creek Graben Zone. Mining will still take place in Federal Coal Lease UTU-74804, for which the operator has right of entry.

The SR extends the underground mining operation in the Hiawatha coal seam up to a vertical boundary established by Beaver Creek. The SR proposal should not effect or cause revisions to the mine pad area or surface hydrologic structures. The operator has obtained a UPDES, mine water discharge permit to discharge directly into a receiving stream. Thus no new structure designs are required.

The reason this mining limit was established at the creek is because the groundwater regime has not been characterized beyond the proposed boundary, although the federal lease and coal reserves extend farther north, well HZ-95-1 is the northern most monitoring site established to identify ground-water characteristics at depth, especially in the vicinity of the intended coal seam.

Prior to mine expansion, beyond this proposed boundary, baseline information is needed to characterize the ground-water in and adjacent to the graben.

SUMMARY OF PERMIT CONDITIONS R645-300-100

As determined in the analysis and findings of this Technical Analysis, approval of the plan is subject to the following Permit Conditions. The applicant is subject to compliance with the following Permit Conditions and has committed to comply with the requirements of these conditions as referenced in the approved Permit.

Accordingly, the permittee must address those permit conditions as found within this Final Technical Analysis in accordance with the requirements of:

R645-100-320, The application to add a federal coal lease to the permit requires approval from the Bureau of Land Management. Prior to mining, the BLM must approve the R2P2 (resource recovery and protection plan) for the additional lease #UTU-74804.

R645-100-320, The application to add a federal coal lease to the permit requires Federal Mine Plan approval from the Office of Surface Mining. Prior to mining the applicant must obtain approval to conduct mining activities as described in Lease #UTU-74804 from The Office of Surface Mining.

GENERAL CONTENTS

GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

Analysis:

Chapter 1 of the federal lease application is an introduction describing where mining activities are currently located, and the location of the proposed federal lease addition, (plate 1-1). Over all changes to the current operation and reclamation plan are relatively minor.

Ownership and control information is in Chapter 2 and appendix 2-4. The applicant/permittee is Lodestar Energy Inc., incorporated under the laws of the State of Delaware and is in good standing and has legal corporate existence. The application includes Lodestar's address, telephone number, resident agent, and employer identification number. The officers and directors of Lodestar Energy Inc., and corporate structure are also identified and are in good standing with the Applicant Violator System. The Resident agent accepting service of process is David Miller and the abandoned mine fee will be paid by Marilyn Adamson. The application includes the MSHA numbers for the Horizon # 1 and Horizon # 2 Mines.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations. When the application is at or near final approval an AVS check is recommended.

VIOLATION INFORMATION

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

Analysis:

Neither the applicant nor any of its subsidiaries, affiliates or persons controlled by or under common control with the applicant has had a federal or state permit revoked or suspended or revoked, nor forfeited a bond in the last five years. There are no outstanding notices of violation.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Analysis:

The Right of Way through BLM lands was incorporated into the Beaver Creek Tract coal lease UTU 74804 on September 1, 1998. Federal coal can only be mined within this right of way. The application includes copies of the leases for the areas proposed to be added to the permit area, and the legal descriptions in these leases match the areas shown on the permit area maps. The applicant with and under the direction of the BLM has requested a modification to stipulation 10 of Exhibit A of the federal lease agreement.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Analysis:

The application includes the legal description and this matches the areas shown on the permit area maps. Copies of the leases for the areas proposed to be added to the permit area are located in appendix 2-3.

The proposed operations will neither be within 100 feet of a public road nor within 300 feet of an occupied dwelling. Coal haulage at the existing mine is within 100 feet of a public road, but the plan contains approval letters from Carbon County regarding use of the public road. The letters are included in Appendix 3-1 and discussed in chapter 3.

According to the current MRP and application, no portion of the area to be permitted is within an area designated as unsuitable for mining, (plate 1-1).

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PERMIT TERM

Regulatory References: 30 CFR 778.17; R645-301-116.

Analysis:

The current permit term for the applicant's permit is five years and expires October 1, 2001.

GENERAL CONTENTS

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Analysis:

The application includes a copy of the proof of publication containing the required information. The advertisements ran from October 31, through November 21, 2000, in The Sun Advocate. A copy of the affidavit of publication was received December 4, 2000.

No facilities would be used in common with any other permitted operation.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

FILING FEE

Regulatory Reference: 30 CFR 777.17; R645-301-118.

Analysis:

A copy of the filing fee is currently on file with the Division, there is no fee required for this revision to the operation and reclamation plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The application format and contents are in concert with the requirements and guidelines of the Utah Coal Regulatory Program.

There are two minor deficiencies noted in the table of contents for chapter three, the page references match the current plan but do not coincide with the text in the application and Plates 3-9, 3-10, and the raptor survey are not listed. These deficiencies have been corrected.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

The applicants technical data has been analyzed under the requirements of the regulations. Authorized and certified entities.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

MAPS AND PLANS

Regulatory Reference: 30 CFR 777.14; R645-301-140.

Analysis:

The maps and plans provided in the application as required are prepared by a certified professional engineer to appropriate scale.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

GENERAL CONTENTS

Analysis:

The information in the application was determined to be administratively complete on October 11, 2000. The applicant has also stated in the application that the information is believed to be complete and correct.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

The application submitted by the operator/applicant pertains largely to the underground extension of the mine. There will not be any new surface development. Surface impacts have been discussed, but not expected. As with all mining there exists the potential of mine subsidence that can migrate to upper geologic units and effect surface and ground water systems, which can in-turn affect land use. The applicant has submitted information which considers potential impacts and describes means and methods to prevent or mitigate any impacts. Information pertaining to the surface disturbance, structures and their reclamation is provided in the Horizon MRP.

Findings:

The applicant has submitted information to evaluate the proposed SR area and mining techniques and methods to conduct mining operations.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521

Analysis:

The permittee shows the new and old permit boundaries on Plate 1-1. That plate was certified by David Miller, a registered professional engineer. Plate 1-1 shows the following:

- The old and new permit boundaries
- The disturbed area boundary
- Township, range and sections
- Topography (80-foot contours)
- Roads and stream

The permittee included a legal description of the permit area in Section 114 of the MRP. The legal description is identical to the leases areas. The permit area contains 711 acres of which 305 acres are fee (Hidden Splendor Resources) and 406 acres are leased from the Federal Government.

In Section 117 of the MRP the permittee included a legal description of the disturbed area and acreage. The actual disturbed area contains 8.23 acres. The reclamation bond amount was calculated using 9.15 disturbed acres. The permittee agreed to continue to list 9.15 acres as the official disturbed acreage.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.12; R645-301-411.

Analysis:

The SR proposal extends the underground operations. There is no change to the approved MRP, Appendix 5-1. The Division has received concurrence from the State Historic Preservation Office.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

Climate is discussed in Chapter 11. The climate information in the plan was gathered the monitoring site of nearby Skyline Mine. The plan puts the respective average annual temperatures for 1993, at the Skyline Mine at 37.7°F. The respective cumulative annual precipitation amounts for these same locations at 27.37 inches. The coldest month of 1993 was January, with an average temperature of -9°F, while the warmest month was August, with an average temperature of 80°F.

Findings:

The plan contains no site-specific climatological data, but an approximate range of data can be determined from the information scattered throughout the plan. The Division finds that this information meets the minimum regulatory requirements. The Division recommends, however, that the operator set up a weather station at the site so that precipitation events can be correlated with other monitoring data.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Analysis:

Chapter 9 of the current operation and reclamation plan provides the vegetation resource information. Plate 9-1 depicting the vegetative communities and acreage has been updated to include the proposed permit area expansion. Vegetative communities include Oakbrush, Salina Wildrye, Maple/Oakbrush/Aspen, Fir/aspen, Alpine Herb/Grassland, Manzanita, and Sagebrush/grass/Rabbitbrush. This information is adequate to predict the potential for reestablishing vegetation. Since there is no surface disturbance proposed with the mining in this area it is unlikely that there will be a need for reclamation practices to occur.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

Analysis:

The Fish and Wildlife Information in the application is referenced in section 3.6 et sec, and discussed in chapter 10 of the current plan. Plate 10-1 has been revised to include the proposed addition to the permit area. This map shows the proposed permit boundary, the location of two raptor nests and big game habitat. The map has been revised to show the identification and location of the three nests located during the May 12, 2000 raptor survey. The proposed addition to the permit area is divided into critical year-long elk habitat and critical summer deer and elk habitats. There is an additional map labeled 2000 Raptor Survey Jump Creek Quad. The map has been identified as appendix 10-3 in the table of contents of chapter 10.

Findings:

The information contained in this section of the application is adequate to meet the requirements of the regulations.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Section 2.117 states that the disturbed area contains 8.23 acres. The bond covers 9.15 acres. The permit and disturbed area boundaries are shown in Plate 1-1.

Chapter 8 covers soil survey information. A soil survey was conducted in 1990. The survey was conducted by Richard Foster, of the SCS. A disturbed area soils map Plate 8-1 was drawn by Patrick Collins (Mt Nebo, Scientific).

This submittal includes a revised permit area soil map, Plate 8-2. The permit area boundary has been redrawn on this map to reflect the new lease.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirement of this section.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.22; R645-301-411.

Analysis:

The land use information is located in chapter 4. Current land uses consist of grazing , logging, mining , mining reclamation activities, recreation and wildlife habitat. This permit application lies beneath an area that is undeveloped. The names , and addresses of the surface owners are provided and identified on plate 4-2. Plate 4-3 shows the ownership and location of the mineral tracts. The applicants legal right to enter is shown on plate 1-1 and discussed in the lease documentation located in chapter 2.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

There is a letter in Appendix 7-6 from SCS dated 6/13/80 stating that there are no Alluvial Valley Floors in the area of section 17, Township 13 South, Range 8 East. As this letter does not cover the revised permit area and as the Alluvial Valley Floor determination is the responsibility of the Division, the issue will be addressed here, on the basis of the information provided in the application. The additional lease area falls within sections 7 and 8 on the north and sections 18 and 17 on the south. The additional lease area is at an elevation of 7600 - 8400 feet and is bordered by Beaver Creek on the north. Beaver Creek lies in sections 7 & 8.

The soil type along Beaver Creek at ~8300 feet elevation is #109 Silas-Brycan loams. The following soil description comes from the SCS Soil Survey¹: these soils are found in low areas adjacent to stream channels or on alluvial fans adjacent to narrow alluvial valleys. The water table fluctuates between 20 - 25 inches.

Surface mining will not be conducted in the area. The premining land use has been undeveloped rangeland utilized for grazing and the deposits of alluvium are small and do not support farms.

In accordance with R645-302-323, the Division finds that the premining land use is undeveloped rangeland which is not significant to farming and that the area of alluvium is small.

Findings:

The permittee has submitted sufficient information to address this section.

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Analysis:

The additional lease area is at an elevation of 7600 - 8400 feet and is bordered by Beaver Creek on the north, Gordon Creek on the south and is bisected by Jewkes Creek. In Figure 8-1, the prime farmland determination dated 9/12/1990 by the Soil Conservation Service states that there are no prime farmlands within sections 7, 8, 17, 18 or 20 of Township 13 South, Range 8 East. The area covered in the lease application extends into sections 7 and 8 on the north and section 18 on the south.

The soils within the lease are were designated #107 (Shupert-Winetti complex) along Jewkes Creek, and #72 (Pathead/Curecanti family association) on the south facing slopes, #63 (Midfork family Podo association) on the north facing slopes and #109 (Silas-Brycan loams) in the Beaver Creek drainage with #124 on the north facing slopes and #72 on the south facing slopes.

Soil type #107 is deep and well drained. The mine surface facilities are located within this soil type.

Findings:

The application provides the required information.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

¹USDA. SCS. 1988. Soil Survey of Carbon Area, Utah.

Analysis:

Other than a revised plate 6-1, no new or additional geologic information has been submitted with this SR. The current coal mining plan includes geologic information in sufficient detail to assist in determining: the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary; whether reclamation can be accomplished; whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and preparing the subsidence control plan.

Chapter 6 of the current plan has a description of the geology of the proposed permit and adjacent areas down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined that may be adversely impacted by mining. This description includes the areal and structural geology of the permit and adjacent areas, and other parameters that influence the required reclamation, and it also shows how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. It is based on maps and plans required as resource information for the plan, detailed site specific information, and geologic literature and practices.

No new logs have been submitted with the SR. Logs of drill holes LMC-1, LMC-2, and LMC-3, drilled in 1976, and LMC-4, drilled in 1980, are in Appendix 6-1. These logs show lithologic characteristics, including physical properties and thickness of each stratum that may be impacted. There is no indication on these logs that ground water was encountered, and Joseph A. Harvey, a consultant who was present during the drilling, has stated that the holes were dry during drilling (Appendix 7-1). LMC-1, LMC-3, and LMC-4, plugged-back to different depths and in different lithologies, were monitored for ground water from 1992 to 1995 and were always dry. LMC-2 was plugged back to a depth of 50 feet and has always been dry also (MRP pp. 7-7 through 7-12). Locations of LMC-1, LMC-3, and LMC-4 are shown on Plates 3-3 and 6-1.

Logs for water-level observation wells HZ-95-1, HZ-95-2, HZ-95-3, completed in the Spring Canyon Tongue of the Starpoint Sandstone, are in Appendix 7-5. The log for HZ-95-1S, completed in a perched aquifer within the Blackhawk Formation, is also in that appendix.

Additional information on lithologic characteristics for the permit and adjacent areas is shown on geologic cross sections on Plates 6-2 and 6-3 in the current MRP. Approximate locations of the boreholes and measured sections used to make these cross sections are shown on small index maps and tabulated in Tables 6-3 and 6-4.

No new chemical analyses for acid- or toxic-forming or alkalinity-producing materials have been submitted with the SR. Coal quality and acid- and toxic-forming potential of coal, roof, and floor samples from the Hiawatha Seam are summarized in Tables 6-5 and 6-6 in the current MRP. Samples were from bore holes LMC-4 and HZ-95-1, HZ-92-2, and HZ-95-3. Copies of analyses reports for samples from LMC-4, for both the Hiawatha and Castlegate "A" Seams, are in Appendix 6-2. Coal analysis reports in Appendix 6-2 include total sulfur and pyritic sulfur. One sample was analyzed for the Castlegate "A" Seam and one for the Hiawatha Seam. Optical differentiation between marcasite and pyrite was done for the two coal samples: the samples were 0.04 percent pyritic sulfur, of which marcasite accounts for 0.001 to 0.002 percent.

Appendix 6-2 includes proximate analyses, including total sulfur, that were reported by Doelling in his 1972 Monograph on the Central Utah Coal Fields for five coal samples from the McGowen Sean in the Blue Blaze No. 3 Mine.

Information on thickness and engineering properties of clays or soft rock in the stratum immediately above and below each coal seam to be mined is on page 6-17 of the current MRP. This information was obtained from the LMC drill holes and certain of the GCD series of holes drilled by Beaver Creek Coal Company. The locations of the Beaver Creek Coal Company holes are on Plate 3-3 (page 6-17).

The Division has not required the collection, analysis, and description of additional geologic information, nor has the Division determined such additional geologic information necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards.

The permittee has not requested that the Division waive in whole or in part the requirements of the borehole information or analysis required of this section.

Findings:

Geologic Resource Information is adequate to meet the requirements of this section.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and analysis

The operator is required to perform all sampling and analysis in a manner that meets the requirements of R645-301-723.

The groundwater, surface-water and point-source discharge site monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Water Quality for Utah Pollutant Discharge Elimination System (UPDES) permits. A UPDES discharge permit application has been secured from the Division of Environmental Health for the sediment pond and mine water discharge for the Horizon Mine operation. The UPDES permit for the Horizon Mine is provided in Appendix 3-7.

When analysis of any surface water sample indicates non-compliance with the permit conditions, the company will promptly notify the Division and immediately take actions to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety is in imminent danger due to the non-compliance.

Baseline information

Within the permit area, the surface water resources consist of streams, springs, wells and ponds. The mine is established in Portal Canyon, an ephemeral drainage, yielded only occasionally flows until the mine started discharging water. Portal Canyon drains into Jewkes Creek. The undisturbed runoff generated above the disturbed area is directed into a 36 inch culvert, UC-2, that runs the length of the disturbed area in Portal Canyon. Mine water is discharged directly into the Portal Canyon culvert.

Jewkes Creek is a perennial stream which receives its flow from rainfall, snowmelt and springs SP-1 and SP-4. Spring Two Canyon, a tributary to Jewkes Creek occasionally contributes flow. Part of the disturbed area lies along Jewkes Creek. Another set of undisturbed 36 inch drainage culverts, UC-1 and UC-3, directs flows from Jewkes Creek under the disturbed area and under the sedimentation pond. Drainage diversions are shown on Plate 7-4.

Beaver Creek is a perennial stream which lies in a drainage opposite the ridge of Jewkes Creek. Its flow path bisects the federal coal lease. Although the current mine plan does not extend across Beaver Creek, the operator has intentions of conducting future mining operations in the federal coal lease beyond Beaver Creek. The area surrounding Beaver Creek is privately owned and some concerns regarding subsidence and water interception have been expressed by the landowner.

There are several springs in the vicinity of Beaver Creek. Perennial and intermittent springs appear near above of the mine area. Springs occur where the recharge potential from alluvium and sandstone units in the Price River Formation and Castlegate Sandstone is high or from fractures created by faulting. Ephemeral springs tend to be linked to shallow aquifers consisting of soils, alluvium or colluvium.

Generally, there is flow in Jewkes Creek and Beaver Creek throughout the year. Several of the adjacent canyons contain flows during the spring snowmelt runoff period and also as a result of isolated summer thunderstorms. Due to the limited drainage area and high elevation of some of the canyons the duration of the snowmelt flow is short and limited to the very early spring. Locations of all baseline water data points are shown on Plate 1. Baseline data information is included in Appendix 7-1.

Plate 7-1 shows numerous springs and seeps exist within, and adjacent to, the permit area, especially in the Beaver Cr./Jump Cr. area. Based on results of the PHC determination, base-line study and other available information, the operator will monitor the significant surface water sources, including drainages above and below the disturbed mine site area, and all point-source discharges.

The operator has provided information on water rights included in Appendix 3-5. The point of diversion for water rights near the mine operations are presented on Plate 7-3. Designated uses and season of use for some water rights are not included in the water rights table provided. The operator has indicated that the area is almost exclusively used for stock watering.

The agreement between Horizon and Florence A. Sweet includes water rights, 91-94, 91-353 and, 91-330. The water rights are associated with two unnamed springs and an underground water tunnel. The point of use associated with the spring(s) are proposed to be changed to Sweets Pond. Domestic and Industrial uses are proposed in association with the Horizon Mine operations.

The operator submitted an update to the water rights lease agreement between Horizon Coal Corporation and Florance Sweet. A canceled check for lease of the water shares indicates the a five year term begins on June 20, 2000 and will expire on June 20, 2005.

Table 1
Water Rights Used in Mining

Water Right #	Season of Use	Quantity of Use (cfs)	Potential Total for Season of Use (AF)
91-94	9/1 to 5/1	0.1500	72.00
91-353	5/1 to 9/1	0.0150	3.66
91-330	1/1 to 12/31	0.5570	2565.00

General Baseline Water Quality

Baseline information was collected according to the 1986 Division guidelines. In early baseline data acquisition the operator collected data according to the 1986 guideline. The Division has a new guideline, effective April 1995. The major difference between the data collected through 1996 and the data required by the new guidelines is the acquisition of certain dissolved constituents, total alkalinity, and phosphates as orthophosphates. Although older data acquisition will provide useful information, new data should be collected according to the new guidelines. The baseline data analysis for the parameters obtained according to each guideline should be discussed in the plan. Baseline information is being collected in accordance with the new guidelines starting in 1996. The operator should provide a table of the baseline parameters. Division guidelines request that baseline parameters be collected at low flow for monitored sites every fifth year prior to permit renewal.

Ground-water information

Seeps, springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in Chapter 7.

Section 6.4.1 discusses site stratigraphy and provides information relative to groundwater in relation to the mine operations. Section 7.1.2 discusses the groundwater resources.

The upper Gordon Creek area is considered a regional recharge source for groundwater, although locally in the permit area it is not a region with potential for large scale groundwater development. Snowmelt and rainfall are the main sources of recharge to the groundwater system in the permit and adjacent areas. The operator provides Figure 7-4 to delineate potential recharge areas and shows a limited recharge potential except in the northern portion of the permit area and in canyon bottoms downstream. The "small" number of springs in the Gordon Creek drainage is described to demonstrate of relatively low area permeabilities by the operator. The operator has not clearly described relationship between the "small number" of springs to the local area aquifers, particularly the water in the Starpoint Sandstone.

The regional area aquifers are the Emery and Ferron Sandstone of the Mancos shale, which probably do not extend to Gordon Creek (thus, the mine area), and the Starpoint Sandstone and Blackhawk Formation which are located in the mine area.

The area is also heavily faulted by major fault zones. The North Gordon and Fish Creek fault zones trend North and South, and North 60 degrees West , respectively. The faulting appears to have influenced the development of Gordon Creek and the locations of springs and seeps in the permit area. Faulting and fracturing provide conduits for surface water to enter the groundwater and allows movement between aquifers. Another major structural feature controlling groundwater occurrence is the Beaver Creek Syncline trending NE-SW with dip at approximately 3.5 degrees.

Locally, potential water bearing members below the Hiawatha coal seam includes the Blackhawk and the Blackhawk-Starpoint aquifer. Both the Blackhawk Formation and Starpoint Sandstone serve as sources of spring and seep flows. According to Price and Arnow, 1974, the upper cretaceous sediments of the area have a low hydraulic conductivities and specific yields of 0.2 to 0.7%. Two pump tests from wells drilled in the Blackhawk Formation in Eccles Canyon indicate transmissivities of 21 and 16.3 gallons per day per foot. The Blackhawk aquifers are generally laterally discontinuous perched aquifers and fluvial channel sandstones

The Hiawatha Coal Seam in the Blackhawk Formation directly overlies the Starpoint Sandstone. The Starpoint Sandstone consists of the Panther, Storrs and Spring Canyon Sandstone members from the stratigraphically lowest to highest member respectively. The Spring Canyon Member is composed of fluvial shales siltstone and channel sandstones (Section 6.5.2.1). The Starpoint Sandstone is approximately 900 feet thick in the Gordon Creek area. The recharge to the Starpoint Sandstone occurs primarily from vertical movement thorough the Blackhawk. The operator suggested that due to the low vertical permeability the magnitude of the recharge is limited. However, the vertical permeability from fractures in the area may be relatively significant.

Above the Hiawatha, the Castlegate "A" coal seam overlies the Aberdeen Sandstone. Drill logs indicate this sandstone member thins near the mine and is discontinuous over the permit area pinching out on the east west stratigraphic section between LMC-4 and the Arco section. The sandstone is interbedded with silts tones and shales. The operator indicates this sandstone is not anticipated to be a significant aquifer because it has a thin interbedded lithology and no springs in the permit or adjacent area issue from the formation (Section 6). The operator has determined it is not practical to mine this seam in the permit area.

The floor of the Castlegate "A" seam is carbonaceous silty shale to fine grained fluvial sandstone. Water production was not observed from the floor in previously mined areas according to the operator. The roof consists of carbonaceous silty shales over 80 % of the permit area and the remaining 20% consists of fluvial channel sandstones that initially produce water then tend to dry up. The general channel trend is NE-SW and the channels tend to increase in frequency to the West. If these channels connect with a Fault, water may be diverted to the mine workings and directed/redirected based on the prominent ground water control mechanisms. The flow rate would be dependent on the fault/channel systems transmissivity. Whether or not this connection exists is unknown

Other members containing aquifers above the coal to be mined include the Castlegate Sandstone, the Price River Formation and unconsolidated alluvial sediment deposits. The Castlegate Sandstone is exposed in the central and northeastern section of the lease block and is approximately 300 feet thick in

the Gordon Creek area. The Price River Formation overlies the Castlegate Sandstone and occurs in the north eastern portion of the permit area. Additionally, unconsolidated deposits occur along valley floors and at the base of steep slopes. Some of these deposits are recharged from the Blackhawk and Starpoint aquifers. The thickest alluvial deposits in the permit area occur along Beaver Creek.

Local Drilling Information and Occurrence of Ground Water

Information regarding baseline groundwater data collection is discussed in Chapter 7, Section 7.1.2.2. Four exploratory holes drilled in 1970's and 1980's were monitored for water in 1995. Drill logs of Holes LMC 1, LMC 2, LMC 3, and LMC 4 are found in Appendix 3A. Also, three wells were drilled and completed in the Starpoint Spring Canyon Sandstone in 1995 and are discussed below.

Tables 1A and Table 1B were generated to present information gathered from the LMC drill holes and the HZ wells. Data from the tables were used in determining ground-water occurrence in the permit and adjacent areas.

Table 2.1
LMC Drill Hole Information

HOLE ID	DATE DRILLED	DEPTH DRILLED	DEPTH OF PLUG	1992 Drill Hole Depth ft msl (depth)	CASTLEGATE Elevation ft msl (depth)	HIAWATHA DEPTH*
LMC-1	Sept. 1976	900 ft.	600 ft.	7,852 (599 ft)	7,658 (793 ft)	Unknown*
LMC-2	Oct. 1976	568 ft.	50 ft.	None	518 ft.	Unknown*
LMC-3	Nov. 1976	836 ft.	665 ft.	7,556 (664 ft)	7,590 (630 ft)	791 ft.
LMC-4	Jan. 1980	430 ft.	220 ft.	7,587 (217 ft)	7,698.8 (105.2 ft)	7,588.7 ft.

*** Drilling completed before reaching the Hiawatha Seam.**

The data shows that groundwater occurs above, within, and immediately below the Castlegate 'A' seam. It is not continuous and may be inconsequential in the strata above the mine. Documentation of the LMC drilling procedure was provided in a notarized letter from Mr. Joseph A. Harvey to Rich White, Engineering Consultant for Horizon Mine, on March 24, 1992 (Appendix 7-1). As stated in Mr. Harvey's letter, all these holes were drilled with air rotary, monitored for water, and found to be dry (during drilling). Thus, no water quality data was collected. Following drilling the drill holes were injected with compressed air and then mud for geophysical logging. The drill holes were abandoned by injecting cement. Mr. Harvey indicated there was an inability to cement the full length of the drill holes because there were large voids connected to the drill hole annulus, thus, resulting in the existing hole depths as measured in the 1995 monitoring.

If one can assume the drill holes would seep water during drilling, and given there were no noted water occurrences in the cuttings, then these drill holes indicate the stratigraphic members above, within, and below the Castlegate 'A' seam are probably dry. LMC 1 was originally drilled to 200 feet above the Castlegate 'A' seam. LMC 2 was originally drilled through the Castlegate "A" seam. LMC 3 was originally drilled through the Hiawatha Seam and 32.8 feet into the Upper Spring Canyon Sandstone. LMC-3 is located north east of old workings developed from the Blue Blaze No.3, Castlegate "A" Seam. Drill hole LMC-4 extended through the Hiawatha Seam, ending 213 feet into the Storrs Sandstone. LMC-4 penetrates old workings in the Hiawatha coal seam and is located in an area that is possibly hydrologically disconnected from the majority of the area to be mined due to the surrounding faults (see Plate 6-1). Therefore, LMC-4 probably does not represent information on groundwater occurrences for the unmined portions of the lease outside of the surrounding faults.

Section 6.5.1.1 states that Drill holes LMC-1, LMC-2 and LMC-3 will be plugged and abandoned following State approved methods. Of the LMC drill holes, it seems as though well LMC-4 could provide information for the mined out area should it flood during or after mining. However, it appears to provide little useful information on aquifers in the baseline/operational phases for the proposed mining area. These wells should be capped now unless they are considered necessary for further monitoring purposes.

Table 2.2
HZ Drill Hole and Well Completion Information

Hole ID	Date Drilled	Drilled Depth ft msl (Depth from surface ft)	Completed Formation	Base of Hiawatha Coal Seam (ft msl)	Screen Completion	Water Elevation Dec.1995
HZ-95-1	12/13/95	7,272.6 (1080)	Starpoint Spring Canyon	7331.6	7,277.6-7,287.6	7570.7
HZ-95-1S	12/5/95	8132.6 (220)	Blackhawk	NA	8,101.6-8,110.6	8221.5
HZ-95-2	12/5/95	7,146.3 (1200).	Starpoint Spring Canyon	7189.3	7,151.3-7161.3	7519.3
HZ-95-3	10/28/95	7,427.6 (470)	Starpoint Spring Canyon	7477.6	7,432.6-7,442.6	7522.7

With the information provided from the HZ wells, the operator has constructed a piezometric map for the Spring Canyon Sandstone. The presented information suggests the Spring Canyon aquifer has a hydraulic gradient of 0.014 and an east southeast direction. The overlay of the potentiometric surface and elevation of the Spring Canyon Tongue was used to estimate the saturated portion of the coal formation. The operator indicates the Hiawatha coal may be saturated very soon in the mining

operations. It should be noted that the coal itself may not be saturated and water that may occur in mine could be produced from the floor.

In building the potentiometric surface map, the operator has assumed maximum water level fluctuations of + or - 30 feet based on Skyline Mine well data from 1982 to the present. The intent in using this data for this purpose is not clear since mining has occurred at Skyline and the change in water levels may not be considered "baseline" information, therefore the use of this data may not be appropriate for the comparison presented.

The HZ wells all appear to be drilled near associated fracture systems. The location of these wells may influence the assumptions used in the potentiometric surface presented in Figure 7-2. Each well, if fracture influenced, may respond according to the behavior of the fracture feature and not the overall piezometric surface of the Starpoint Sandstone.

For instance the piezometric surface elevation varies by 51 feet over approximately 4,000 aerial feet between HZ95-2 and HZ95-1, having an approximate 0.0128 feet/foot water surface gradient between those wells. If one looks further into the structural geology of the area it would be noted that the permit area sits between a WNW-ESE trending fault. A gentle NW-NE dip is associated with the Beaver Creek Syncline. The Beaver Creek Syncline axis trends and plunges to the north. Rocks dip 3-5 degrees on both limbs of the fold except where steepened by fault drag or fault displacement. The fold follows Beaver Creek drainage up to Section 8, T13 S R8 E where Beaver Creek diverges from the axis to the north east along a suspected fault zone. HZ95-1 appears to be located on the other side of the Beaver Creek Fault Zone. If the structural geology controls the piezometric surface such that the south side of the Beaver Creek Fault Zone has a piezometric surface somewhat separate from the north side, a gradient for the piezometric surface may occur on the south side of Beaver Creek in a north west direction.

Except for the HZ-95-1S well, the majority of the springs issue above the presented Piezometric surface of the Starpoint wells. This may indicate the Starpoint is not in connection with the fractures. However, the operator has not completed this well fully through the formation and there is some question as to whether lower sandstone tongues may have a greater connection with the fractures. Additionally, no lithologic or geologic logs are presented and the initial occurrence of water was not presented in the SR. Water levels, other than the December value, could not be located in the MRP. Because many of the formations in this region are fairly slow to transmit water it is unknown if the well has reached equilibrium.

Recent monitoring of HZ-95-1, during later 1999 and 2000, indicates that pumping associated with mine water discharge is effecting the water level (head) in the well. HZ-95-1S has not shown extensive drawdown. All wells and springs have shown a decline in the past year, likely the result of a dry year.

Additional water level information should be collected and submitted to substantiate that the wells are at being effected by pumping or are in equilibrium. No pumping test data or drill logs are presented for these wells. Pump testing or other methods of determining the hydraulic conductivity of these wells would provide a great deal of necessary information on whether these wells were influenced by the nearby fracture zones. Logs of these wells should verify whether aquifers exist above the coal seam as identified by the presented LMC holes. Unfortunately it appears these wells are all completed in the upper tongue of the Starpoint Sandstone and are not completed through the formation. The operator

must provide the geophysical and lithologic logs and hydrologic conductivity (pump test data) for these wells.

The advantage to the location of these wells becomes critical should the mining operations intercept the related fracture system. These wells will be useful in determining the first year mining impacts. However, the Operator's five year mine plan proposes to mine through the Beaver Creek Fault Zone and will also mine through well HZ95-1 potentially eliminating the third point used to monitor the Starpoint piezometric surface. There is a possibility the information would be necessary to complete the CHIA if additional information does not adequately describe the groundwater system. It is recommended that the additional well be placed on the north side of Beaver Creek and outside of the proposed mining area, within the graben but, away from a local fracture and be completed through the formation, in each sandstone tongue: not just the first tongue of the Starpoint. It should be noted that the Deficiency from the previous Blue Blaze mine proposal required the well be drilled through the formation in order to mine into the Hiawatha coal seam.

Previous Mining History

According to the operator the Gordon Creek #2 Mine operated by BCCC in the Castlegate A seam received sporadic occurrences of groundwater inflow which dried in a short time period. The Gordon Creek #3 Mine operated by BCCC in the Hiawatha Seam (located east and down gradient of the permit area) received approximately 400 g.p.m. inflow when a 12 foot graben was encountered in the northeast section of the mine. Water was produced from the floor. When retreat mined later the area was dry as a result of previous dewatering or elevation differences upgradient of the mine. It was also deemed possible that groundwater stored in the fault zone did not have a significant recharge rate that maintained the flow.

The location and extent of all known abandoned underground mine workings within the permit area and adjacent area are not shown on Plate 3-3. This information is critical to the development of the PHC and the CHIA.

Springs

The PAP indicates baseline reconnaissance information was gathered in the field with an Oil, Gas and Mining employee named Darin Worden from 1988 to 1990. Other information was derived from state and federal published open file reports. A complete spring and seep survey in the proposed permit and adjacent area was not conducted. Currently the PAP does not contain a map showing spring locations in the permit and adjacent area.

The baseline sampling information is gathered from springs which issue from the Blackhawk Formation and were characterized as Calcium Bicarbonate type waters.

Table 2.3
Baseline Spring Sampling Summary
 (Summary of information from Plate 7-1, Figure 7-3 and Sections 7.1.3, 7.1.5 and 7.2.6)

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
SP-1 1989 to present	Station #1 1989 through 1993	Issues from Hillside and flows into Jewkes Creek (Blackhawk Sandstone unit above coal seams 8195 ft msl.)	TDS 230-330 mg/l pH 7.5 - 8.5	Late Spring 10-15 gpm High flow on 5/89 was 45 gpm Late Summer/Fall 5 to 6 gpm	
SP-2 1989 to present	Station #2 1989 through 1993 (This description matches the station number 1 previously; Channel in North Fork of Gordon Creek.)	Issues from Hillside and usually flows approximately 100 feet (Blackhawk, 8005 ft msl)	TDS 480-540 mg/l pH 7.5 - 8.5	Flow in Late Spring 1-2.5 gpm Flow in Late Summer/Fall <1 gpm Dry 7/1991, 8/1991, through 12/1992	Spring flows through alluvium below the point of origin.
SP-4 1989 to present	#4 1989 through 1993	Jewkes Creek Drainage flows along road empties into Jewkes Creek (Blackhawk, 8102 ft msl)	TDS 350-480 mg/l pH 7.5 - 8.5	Flow in Late Spring 1-2.25 gpm Flow in Late Summer/Fall <1 gpm	Location not clearly mapped
SP-6 1989 to 1995	#6 1989 to 1995	Upstream from the proposed mine portal (Blackhawk)	N/A	dry from 1989 through 1995	This location is not a spring and will not be included in future monitoring

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
not found	Gunnison Homestead Spring/Tributary to Beaver Creek near confluence of spring discharge channel and Beaver Creek	(Blackhawk)	not discussed	3-136 gpm the 136 gpm included snowmelt runoff.	Location removed from Figure 7-3
SP-9	Jewkes Spring U.S.G.S. 1979-1983 Station 2-5-W Beaver Creek Coal Company 1985-1995	Near Beaver Creek Channel, south west corner of proposed LOM permit area. (Blackhawk, 8550 ft msl)	TDS 240-300 mg/l pH 7.5 - 8.5	Typical Late Spring flow 20 to 60 gpm decreasing late fall 1.10 to 38 gpm (Maximum flow on 7/85 was 1372 gpm considered inaccurate)	Location mapped on Figure 7-3 Information on flow discussion in Section 7.2.2.2 varies from Section 7.1.2.2

In Section 6.4.2 the operator has indicated a series of springs in the North Fork of Gordon Creek in the north west corner of Section 18 T13S R8 E may be related to faults bisecting the area. The North Fork drainage may have formed subsequent or contemporaneously with the movement along the Gordon Creek Fault Zone.

The operator has stated the Homestead Spring is one of the main contributing springs to Beaver Creek. However, the operator has not included this spring in the baseline or operational monitoring regime. The operator has identified this spring as important to Beaver Creek flows, but has not indicated why the spring should not be part of a sampling point (i.e.; why is this spring considered outside the zone of potential impact?).

Groundwater Quality

Two water quality samples were collected in the Blue Blaze No. 1 Mine workings, one in May 1992 and one in November 1995. The water was determined to be a calcium bicarbonate type with TDS ranging from 414 to 452 mg/l and pH from 6.8 to 7.66.

Groundwater collected from the HZ wells in December 1995, November 1996, and January 1996 may have been somewhat affected from the foam drilling fluid used during installation. Data analyses indicate TDS ranged from 380 to 680 mg/l. Due to the potential effects from the foam drilling additional water quality data is necessary.

Surface-water information

The Horizon Mine lies within the headwater streams of the Price River Basin. Major drainages within the permit and adjacent area are; Beaver Creek north of the mine site, and the North Fork of Gordon Creek and Gordon Creek south of the mine site. The disturbed area drains into the North Fork of Gordon Creek. The State Division of Water Quality classifies Gordon Creek as Class 3C and Class 4 waters. These classifications are designated as; non-game and aquatic life, and agricultural uses, respectively. Beaver Creek, located over the future proposed mine workings, is classified as 1C and 3A, designated as domestic and agricultural uses respectively. Down stream of the proposed disturbed area in Gordon Creek there are fisheries. Information on the fisheries is lacking in the plan. For further discussions see the **Fish and Wildlife** sections in this TA.

Drainages adjacent to the proposed disturbed area are named for referencing purposes as shown on Plate 7-4. The following designated names are assigned for the drainages flowing through the proposed disturbed area:

- 1) Jewkes Creek - the main drainage through the site which joins the North Fork of Gordon Creek's main stem at the southern boundary of the permit area.
- 2) Portal Canyon - this drainage is the first drainage entering from the west after crossing the permit area boundary and joins Jewkes Creek. The portal entries are located in this drainage.
- 3) Spring Two Canyon - is the second drainage entering from the west after crossing the permit area boundary and joins Jewkes Creek. This drainage is upstream of the disturbed area.

Streams within the permit area receive their maximum flows in late spring and early summer as a result of snowmelt runoff. Flows decrease significantly during the autumn and winter months. Jewkes Creek has experienced no flow during the winter and late summer months.

Beaver Creek is a perennial stream with base flow maintained by seeps and springs. Beaver ponds are common in Beaver Creek and also play a part in providing perennial flows. Springs contributing to base flow include the Gunnison Homestead Spring, within one mile west of the proposed additional lease area, and Jewkes Springs one mile west of the permit area near the north west corner. Discharges from these springs vary between 3 to 136 gpm and 1.1 to 38 gpm respectively.

The USGS maintains a gauging station (09312700) near the mouth of Beaver Creek several miles northeast of the permit area with a period of record from 1960 through 1989. The minimum annual discharge for this period was 338 acre feet in 1961. The maximum annual discharge of 1,610 occurred in 1973. The average annual discharge for the 29 year period of record was 3,310 acre feet. Decreases in downstream flow are observed in Beaver Creek between monitoring stations SS-7 and SS-8. The decrease is most prevalent during the low flow season. This losing stream section may occur due to either alluvium, fracture and fault systems or other unknown factors.

The operator discusses the annual variability of flow in Beaver Creek. Although there is annual variability, the variability in base flow related to snowfall and possibly spring run off would provide

more significant information. Snowmelt survey and precipitation information, where available, should be used to compare annual base flow changes with the precipitation rates.

Jewkes Creek drains a watershed area slightly greater than 1 square mile and discharges to the North Fork of Gordon Creek. The operator has referred to this stream as intermittent. The flow data submitted indicate that normally the creek flows all year at Sampling Point 5, but becomes intermittent at Sampling Point 3. The flow diminishes in a downstream direction beyond sampling point SS-5, infiltrates into the alluvium and does not reappear immediately downstream according to information in the PAP. Water may reappear one half mile down stream in the North Fork Gordon Creek where the Mancos shale outcrops. A potential reason for the diminished flows in this area may be due to recharge of subsurface soils in the riparian area near this monitoring site. Characterization, by collecting water quantity data and by observation in the North Fork of Gordon Creek, to determine whether this stream re-emerges as constant flow downstream should be made.

The North Fork of Gordon Creek flows along County Road 290 southeast of the permit area. The elevation of the creek is lower than the Hiawatha coal seam. The operator suggests the mining of the Hiawatha would not affect the quantity or quality of flow in the North Fork of Gordon Creek. However, the operator has shown the Spring Canyon Aquifer below the Hiawatha coal seam contains water and mining might reduce the piezometric water elevation potentially affecting the surface water in this stream. Discharge from the Starpoint aquifer to this stream section should be determined. Losing and gaining reaches in this section of the stream should be identified.

The proposed Five Year Mine Plan as shown on Plate 3-3, illustrates a proposed lease area to the north and east of the currently designated permit area. The surface water descriptions and baseline information for the permits adjacent area have not been presented. The Operator's future mining operations are proposed to take place under Sand Gulch and an unnamed drainage to the north. No baseline information was collected for this area. In addition, Plate 3-3 shows the major fault systems which run northeast and southwest of the proposed mine operations. This fault system should be used to describe the geologically defined adjacent area. The graben and fault system appears to extend all the way up to Jump Creek. Additional baseline information will be necessary to permit this site in the future and may be necessary to complete the CHIA. Further baseline sampling should focus on the springs and surface waters potentially impacted through intercepting water from faults and fractures and diverting. Baseline information should extend to Jump Creek until adequate information is supplied to the Division to consider Jump Creek outside of the adjacent area.

Table 2.4
Baseline Surface Water Sampling

Sampling Point	Location	Flow	Water Quality	Comments
#3 1993 through 1995	Channel in Jewkes Creek /below disturbed area upstream of the intersection with the North Fork of Gordon Creek and below the surface facilities.	Intermittent	TDS 388 to 799 mg/l. Total Fe <0.02 to 8.7 mg/l Total Mn <0.01 to 0.05 mg/l TSS <1 to 72 mg/l pH 6.25 to 9.5	Information presented in the text does not match the data in appendices
#5 1993 through 1995	Jewkes Creek upstream of disturbed area but downstream of the confluence with Spring Two Canyon.	Perennial	TDS 198 to 550 mg/l. Total Fe .05 to 3.9 mg/l Total Mn 0.05 to 1.0 mg/l TSS 1 to 245 mg/l pH 6.7 to 8.99	Information presented in the text does not match the data in appendices
#6 1991 through present	Right Fork North Fork Gordon Creek In the east Drainage above proposed portals and disturbed area	Ephemeral	Removed from proposed monitoring schedule. Samples were never obtained.	This should be monitored on the same day as sites 3 and 7 when sampling during a precipitation event or snowmelt period
#7 1991 through present	Beaver Creek above pond upstream of the proposed future permit area outside of potential subsidence zone?.	Perennial	TDS 216 to 353 mg/l. Total Fe 0.05 to 5.19 mg/l Total Mn <0.1 to 0.19 mg/l TSS <1 to 297 mg/l pH 6.0 to 8.54	Beaver Creek tends to have a lower TDS than Jewkes Creek.

ENVIRONMENTAL RESOURCE INFORMATION

Sampling Point	Location	Flow	Water Quality	Comments
#8 1991 through present	Beaver Creek station downstream, does not appear to be downstream of potential impact area for future mine plan.(see Plate 3-3 and 7-1).	Perennial	TDS 192 to 357 mg/l. Total Fe <0.02 to 1.3 mg/l Total Mn <0.01 to 0.078 mg/l TSS 4.0 to 52 mg/l pH 6.6 to 8.69	Flows tend to be lower than the upstream Beaver Creek station. Located near the Fault system.
2-2-W	Gordon Creek above confluence of North Fork Gordon Creek below the Hiawatha	Perennial	Not discussed.	Impact more likely to be below confluence because of fracture system.
2-3-W	Beaver Creek	Perennial	Not discussed	Monitored by Beaver Creek Coal. Not found on any map
2-4-W 1982-	Beaver Creek 1 -1/2 mile west of permit area	Perennial	Not discussed	Monitored by Beaver Creek Coal.

The operator has not adequately discussed the variation in the data presented as baseline information. Data presented in the text does not reflect data presented in the appendices.

Baseline cumulative impact area information

The Division will make a findings of the cumulative impacts when the SR application is complete.

Modeling

Actual surface and ground water information is supplied in this application; therefore, modeling is not proposed. No surface water modeling has been conducted.

Alternative water source information

In Section 7.1.6 the operator purports no significant impacts are foreseen to ground water as a result of mining in the permit area. In Section 3.4.3, page 3-18, the operator states, "As noted in Section 7.1.6, alternative sources will be developed and provided if water rights or uses are affected by mining operations", however, no discussion on alternative sources were presented in this section. Section 3.4.3

states, "Should Horizon's mining activities cause an adverse impact on the areas water supply, the operator intends to mitigate the effects. The mitigation will be negotiated between Horizon and the injured party".

Because "Alternative Water Source Information" applies to Surface Mining and Reclamation activities under R645-301-727 there are no requirements under this regulation as it applies to underground mining. However, the operator is required to notify the Division of Oil Gas and Mining when analysis of any ground-water or surface water sample indicates non compliance with the permit conditions, which include the performance standards under 752.220 through 752.250. The Division of Water Rights and other agencies may also request notification should a water use be disrupted.

Information provided in the PAP indicate the water rights applied for are a leased right and not an acquired right. Therefore, the operator would not be able to replace a right with these sources should diminution or quality of a water right be impacted through mining activities.

In the MRP, Section 3.4.3, the operator should remove the reference to discussions found in Section 7.1.6, regarding replacement of water rights, since there are no such discussions. The operator should cross reference Section 3.4.3, which describes the actions to be taken should loss of a water right use result from mining activities under Section 7.1.6 in order to provide a clear plan. The requirements under R645-301- 731.223 and 731.212, should be addressed. The operator should provide a plan which clarifies who will be notified should it be known that a water resource has been impacted by mining activities

Probable hydrologic consequences determination

Acid- and Toxic-Forming Material

Operational Monitoring and Identification of Acid- and Toxic-Forming Materials

The operator has not provided a specific discussion for the potential for acid and toxic forming materials under the Probable Hydrologic impacts. However, the operator provided the following in other sections of the plan:

- Disposal of waste rock from partings and splits will be in underground workings. No acid or toxic forming materials are present in the overburden or underburden for samples analyzed (Section 6.5.7.1), suggesting no acid or toxic forming materials will be in the partings. The waste rock will be backfilled and compacted after second mining subsidence occurs and the waste rock will not be saturated, thus, water quality would not be impacted (Section 3.3).
- If underground waste cannot be blended, sold, or gobbed, arrangements will be made to dispose of this material in permitted refuse piles at a nearby mine.
- Noncoal waste rock from initial development will be incorporated as fill in the mine yard (Section 3.3).

Table 6-5 summarizes the quality of the Hiawatha Coal seam. The acid base potential of each of the three coal samples collected from the HZ-series holes indicate the coal has a potential to be acid-

forming (Section 6.5.6). Coal will be stored on the surface for short periods and run off from the coal stockpile will be routed through the sedimentation pond where it will mix with run off water that is more alkaline.

Tests for acid and toxic forming materials were conducted on roof and floor samples in LMC-4 and HZ drill holes. One sample contained a high pyritic sulfur content of 0.24 percent. The operator suggests this pyritic sulfur content is likely of limited areal extent. This information conflicts with the statement in Section 6.5.7.1.

In Section 6.5.6, the operator has presented analysis from a core sample of the coal obtained from the Hiawatha Seam, drill hole LMC-4. The presented analyses has a sulfur content of 0.47% of which 0.04% is pyrite sulfur with marcasite, 0.038% pyrite and 0.002% is marcasite.

All of the coal will not be removed from underground. Much of this coal will be in contact with air and water during the mining operations and may cause a lowering in the pH of those waters. Currently water from the old Blue Blaze No.1 Mine workings are shown to have a pH of 6.8 to 7.66. In general, these are lower than the surrounding area pH values.

Acid forming discharges have been uncommon and are generally not regionally extensive. Should the presence of pyrite in the mine area cause a decreased pH locally the mixing with higher pH waters in the system would result in localized affects due to downstream buffering.

Where material is trucked to permitted refuse piles at a nearby mine, the acid and toxic characteristic of this material should be known at the permitted mine receiving the waste.

Potential Groundwater Impacts

The operator indicates inter basin transfer out of the Price River drainage cannot occur in this region. However, inter basin transfer between Beaver Creek and Gordon Creek could occur. Because the coal seams dip away from the portal entrance, flow is likely to be sumped underground and could be directed toward the fault systems to the northwest, however, the Operators information indicates the Piezometric surface for the Starpoint regional aquifer is to the east southeast. Flow will occur in the direction influenced by the prevailing geologic controls which are not definitively known at this time.

The control of faulting on groundwater flow can be seen by comparing the potentiometric surface map to the geologic structure. The operator indicates that due to low permeability, and due to the plan to avoid mining into faulted zones, in flow to the mine from faulted zones is projected to be minimal (Section 7.1.2.2). Discussions on how the faults will be avoided were not presented.

The operator has concluded that the Hiawatha coal seam will be saturated from the beginning of mining operations. The rate of inflow will depend primarily on whether a faulted zone is encountered that contains groundwater in storage or that is in connection with an overlying perched aquifer. Although the possibility of a significant sustained inflow occurring is probably low to moderate, the actual potential impact from intercepting a fracture reservoir and depleting or intercepting the flow is moderate to high. A resulting loss of head could disrupt stream and spring flows and possibly recharge the fracture zone down dip to the north east or in the direction of regional flow to the east southeast. Changes in quantity and quality to spring and surface water discharges associated with the faults could be the result.

Waste rock from the mining procedure is proposed to be gobbed underground and backfilled. Because the materials will have an increased surface area due to removal the potential impacts, should water and air come in contact with the materials, would be increased TDS (ions in solution) and potential acid and toxic formation. Data from a recent underground mine water sample from the No. 1 Mine is found in Chapter 7 and may be indicative of some potential water quality changes. See the section above on **Acid and Toxic Forming Materials** in this TA.

Section 3.3.1, Plate 3-3, does not show all known and existing mine workings in the permit and adjacent area. These areas are critical to supporting documentation regarding the Probable Hydrologic Consequences of mining as it might relate to other mines v.s. the proposed Horizon Mine. The operator must include this information in the plan for all seams and mining in the permit adjacent area.

The operator states, "It is not anticipated that large quantities of ground water will be encountered throughout the duration of mining". The Division believes the potential for impact increases, if water is intercepted by mining through paleochannels associated with fractures, or a water bearing fault/fracture system is intercepted by mining activities. The potential for impact appears to be highest if fracture associated flows in the Hiawatha Seam are intercepted as occurred in the Beaver Creek Coal Mine.

The operator has estimated the "worst case" potential inflow through a porous formation (exclusive of fracture flows) to be 2.6×10^{-4} and to have an average potential inflow of 1.5×10^{-4} . Or, a flow rate of 9 and 5 gpm per section. Assuming six sections the total potential inflow would vary between 30 and 54 gpm. This information assumes a worst case scenario between 270 to 130 feet of head. Therefore, the potential is that a decrease of head in the Starpoint aquifer of between 270 and 130 feet could occur over time. The extent to which this affects the adjacent area is limited to the interaction of the members along the fault zones and determination of discharge areas. The aquifer may be dewatered within the graben with out interaction with the fracture/fault related waters or, may affect the waters associated with the fault system.

Potential Surface Water Impacts

On page 7-22, the operator states that proposed mining operations will occur north of Gordon Creek and should not effect the quantity or quality of water in this drainage. However, it was noted that approximately 400 g.p.m. inflow was produced from the floor when mining the Hiawatha Seam. This information, along with the dewatering estimates discussed above under the *Potential Groundwater Impacts* of this T.A., indicate there may be a potential to intercept groundwater flow from below the Starpoint aquifer, below the Hiawatha Seam. This flow interception could impact base flow to Gordon Creek, or relocate the source of the flow. Supporting information can be determined by assuming the control point for the piezometric surface would likely be at the elevation related to the dip. With a dip of 5.3% to the northwest an outcrop elevation of approximately 7,600 and a maximum linear distance down dip of 5,000 feet the zone of influence most likely to be impacted below the Hiawatha Seam would be from approximately 7,600 ft to 7,335 ft. This is also within the range of the piezometric surface of 7,500 and is in the general direction of the assumed groundwater flow. Water quantity, water quality, and losing and gaining sections for reach segments should be determined for Gordon Creek above and below this section. A continuous recording flume is recommended for operational monitoring if the characteristic of the stream is determined to be potentially impacted.

The operator indicates the water associated with the Beaver Creek Coal Company No. 3 Mine is believed to be in communication with Beaver Creek and will be avoided when mining the proposed Horizon No. 1 Mine. Avoidance will occur by closely monitoring the activities in the fault area. The operator has not demonstrated why they believe the communication with Beaver Creek exists and has not provided a monitoring plan which addresses this potential impact.

Subsidence Control and Renewable Resource Protection

The Stream Buffer Zones will be maintained beneath Beaver Creek and the North Fork of Gordon Creek should mining proceed beneath either creek (Section 3.3.2.2).

The proposed stream channel buffer zone is shown on Plates 3-3. Retreat mining will not occur under those areas shown to be within the buffer zone. A discussion on the width of the buffer zone was not found. The operator has stated that mining is designed to preclude subsidence of perennial and intermittent stream reaches. Specifics to the statements regarding these buffer zone areas could not be located. However, comments made by the operator suggest that massive sandstone units make it unlikely that subsidence will reach the surface, and swelling shales in the overburden would have a tendency to heal fractures.

According to the Operators subsidence plan a measurable subsidence effect would include a marked decrease in flow of 30%. In order to determine whether a marked decrease in flow occurred frequent monitoring would be required. The operator should describe how the monitoring plan monitors for this potential impact.

The operator suggests the following reasons indicate potential for damage due to subsidence will be low because no noticeable mining subsidence has occurred in the Gordon Creek #2 area (mined over 40 years ago) and in the Consumers No. 3 Mine, Section 3.2.3. The following areas were previously mined beneath Beaver Creek

- Swisher Coal Company mined under Beaver Creek in the northern most west panel of the Castlegate "A" seam in January 1978. Overburden is approximately 650 ft.
- Beaver Creek Coal company mined under Beaver Creek in the "A" panel in September 1981. Overburden was approximately 425 feet.

Although longwall mining subsidence occurs immediately following mining, room and pillar subsidence may not occur for a long period of time. The proposal to monitor subsidence annually for two years following cessation of mining is probably adequate for determining immediate subsidence response. However, prior to bond release the lack of, or presence of, subsidence should be confirmed.

Statements in the PAP indicate that if significant inflow of groundwater occurs mitigation measures may include; attempts to seal the inflow, increased monitoring program, lining the stream bed through an effected area, and replacement of water, should it be indicated through monitoring to be mining related (Section 3.4.8.2). In Section 3.4.8.4, the operator commits to notify the Division in writing and begin implementation of the approved mitigation plan if adverse impacts to Beaver Creek are noted as a result of mining. The operator will be encouraged to complete short term mitigation measures such as sealing the flow from in the mine. However, Division notification should occur as soon as possible and coordination with concerned parties may be necessary prior to approval of a site specific mitigation plan.

Water Use

"Water will be pumped from the North Fork of Gordon Creek into the mine for use in dust abatement". Based on the predicted inflow information the operator has estimated approximately 31 acre feet per year will need to be pumped into the mine, while it is estimated that 41 acre feet will be removed with the coal each year. The water rights applied for by the operator exceeds the predicted water needs.

Sediment Yield

The potential for increased suspended solids and sediment loading to Gordon Creek is probably highest during the construction phase of operation and reclamation. The operator has committed to monitor for turbidity of the water upstream and downstream of the site during the construction phases. A criteria for Class 3C allows a turbidity increase of 15 (NTU).

Increases in sediment during the operational period will be minimized through the use of a sedimentation pond and drainage controls. The operator has also committed to store snow in sites that will directly drain to the sedimentation pond (Section 3.3). During the reclamation period it is not clear whether alternate sediment control measures or sedimentation pond measures will be used.

During the past four years logging activities have taken place in the Beaver Creek area on Stamatakis property. Logging and transport activities have disturbed substantial areas along the roads and riparian areas of Beaver Creek, the North Fork of Gordon Creek and Jewkes Creek. Trees are removed from the property and transported out over the county road which connects to State road 139, the North Fork of Gordon Creek. There have been no Best Management Practices for logging conducted

on this logging site. Sediment yield from the logging sites and roads has been substantial. During the summer of 1997 the team conducting a subsidence noticed areas logged down to the Beaver Creek without a protection barrier. Sediments from the logging sites and access road flowed directly into the creek. Trees and branches littered the side of the creek. The dirt road along Beaver Creek was ground to a fine powder, in some places as much as 1 foot deep. The point bars and bottom of Beaver were covered with silt.

Logging continued during the winter months. As roads became muddy the logging company used a graders and bulldozers to excavate the muddy layers which were pushed in mounds above the roads and creeks, where they could easily flush into the creeks (Beaver Creek, a tributary to the North Fork of Gordon Creek and Jewkes Creek. Sediment loading into the creeks will likely continue until logging is completed. Operational monitoring could show significant changes in water quality and aquatic wildlife levels as a result of the logging practices.

Surface Water Quality

Currently coal mining waste may exist near Test Pit No. 8. This waste (potentially 9,718 cubic yards) is proposed to be stockpiled adjacent to the coal stockpile and blended (Section 3.3.2.7). The operator has stated that if acid and toxic materials remain on site they will be buried by 4 feet of cover. Currently water moves through the fill and seeps toward Jewkes Creek. The water quality of this site is likely to be improved with the proposed reclamation measures.

The operator should provide a discussion on potential changes in water quality based on data obtained from the Blue Blaze in mine waters. Based on impacts from other mining operations the potential for increased TDS is likely in the permit area. The operator sites downstream increases in TDS when flowing over Mancos as a factor in considering impact as minimal. Because downstream waters are naturally degraded the use and quality of the upstream waters retains its importance. However, impacts to downstream waters would probably not be notable.

The road to the mine is maintained as a gravel road therefore the use of road salting is not likely to affect water quality.

Hydrocarbons

Loadstar Energy Inc. indicates Diesel fuel, oils, greases and hydrocarbon products will be stored above-ground and may be spilled in the mine and on the surface during mining operations. An above ground 5,000 gallon diesel fuel tank will be located between the coal stockpile and the truck turn around as indicated on Plate 3-1 (review plate for proximity to surface water). A shop maintenance area will be located next to the mine office area.

The operator proposes the berm surrounding the tank will be adequate to contain the total volume of the tank, in the event water needs to be drained from the berm. The operator indicates spills will be handled in accordance with the Spill Prevention Control and Countermeasure (SPCC) Plan. This plan is provided in draft form without a certified signature in the PAP under Appendix 7-8. Elements of the plan include:

- Visual inspection of all tanks, associated valves piping and containment areas.

- Notification to the Mine Manager and containment of the spill Reporting requirements for spills.
- Procedures for preventing spills during filling tanks.
- A copy will be maintained on file in the Mine Manager's Office and the Mine Engineer's office.

The Operator's proposal uses accepted practices for their SPCC plan. The operator should include clean up procedures for small scale spills, commit to retain absorbent materials on site and, should provide either a concrete containment structure with a drain or provide for disposal and sampling of the earth material below the fuel tanks and areas of hydrocarbon use.

The operator can provide additional reasonable operation measures to minimize hydrologic impacts on and off the permit area.

Flooding or Streamflow Alteration.

The operator discusses the potential for flooding as being diminished due to the sedimentation pond reducing peak flows. In addition to the Operators comments, it is likely that the water flowing through the culvert will have increased flow velocity over the natural velocities for the same discharge rates. A potential impact includes downstream erosion. The operator has provided riprap channel designs for the velocities than may occur from a 100 year- 6 hour event which meets the minimum regulatory requirements. Other potentials for streamflow alteration are discussed under Potential Surface Water Impacts and Potential Groundwater Impacts.

Findings:

The operator has submitted sufficient information to address this section.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

The affected area, as defined by R645-100-200, includes both the area of actual surface disturbance and the area above the underground mine workings, which might be affected by subsidence resulting from the underground mining operation.

The boundary of the disturbed area of the Horizon Coal operation, which includes proposed as well as previous disturbance, is shown on Plate 3-1--Surface Facilities. The boundaries of all areas which are to be newly disturbed by this operation are also shown on Plate 3-6--Premining Topography and Plate 3-7--Post Mining Topography.

Archeological Site Maps

No archeological sites have been identified on the SR.

Coal Resource and Geologic Information Maps

Plate 6-1 has been revised to show the proposed boundary. Other than that change, there has been no addition or change to Plate 6-1.

Additional information on lithologic characteristics for the permit and adjacent areas is shown on geologic cross sections on Plates 6-2 and 6-3 in the current MRP. Approximate locations of the bore-holes and measured sections used to make these cross sections are shown on small index maps and tabulated in Tables 6-3 and 6-4. The relationship of these cross sections to the proposed revised permit area is not clear. A few bore holes are shown on Plate 7-1, but only one (LMC-4) of the bore holes used to construct these cross sections is shown on that map, and none are shown on Plate 6-1. Locations of the bore-holes and measured sections used to construct these cross sections need to be shown accurately on Plate 6-1 or 7-1 or other suitable map.

Cultural Resource Maps

The SR proposal extends the underground operations. There is no change to the approved MRP. An evaluation of cultural resources has been conducted and a negative findings is presented, Appendix 5-1 of the MRP.

Existing Structures and Facilities Maps

No new structures will be developed above the SR area. All surface facilities and structures are described in the MRP.

Existing Surface Configuration Maps

Pre-mining, operational and reclamation surface configuration maps are located in the MRP.

Mine Workings Maps

Old mine workings are shown on Plates 3-9 and 3-10. Projected mine workings are on Plate 3-3. The location and extent of all known abandoned underground mine workings, including mine openings to the surface within the proposed permit and adjacent areas, are shown on Plate 3-3--Five Year Mine Plan. There are no active underground mines and there has been no surface mining within the permit and adjacent areas.

Monitoring Sampling Location Maps

The permit application package identifies that the location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas. Both geologic and groundwater information were obtained from test borings done at sites designated LMC-1, LMC-2,

LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Permit Area Boundary Maps

The permittee shows the new and old permit boundaries on Plate 1-1. That plate was certified by David Miller, a registered professional engineer. Plate 1-1 shows the following:

- The old and new permit boundaries
- The disturbed area boundary
- Township, range and sections
- Topography (80-foot contours)
- Roads and stream

Surface and Subsurface Ownership Maps

The topography of the proposed disturbed area is shown by contours on Plate 3-6--Premining Topography and by profiles on Plate 3-2--Premining and Operational Cross Sections. Plate 3-6 also shows the extent and nature of existing disturbance and all existing manmade structures.

Representatives of the Division visited this site several times in 1991 and 1992, in connection with the Division's review of the original Blue Blaze proposal, in order to observe the site and check the accuracy and completeness of the maps, which are identical to the maps found in the present plan. The Division found that the maps cited in this section--Plate 3-6--Premining Topography and Plate 3-2--Premining and Operational Cross Sections--accurately show the existing surface configuration of the proposed disturbed area, as defined in this section, and thus fulfill the requirements of this section.

Subsurface Water Resource Maps

The aquifers associated with the Castlegate "A" seam were determined to be discontinuous over the area to be mined and therefore have not been mapped. Information for the Hiawatha seam is presently being gathered.

Surface Water Resource Maps

All surface and subsurface manmade features within and adjacent to the permit area are shown on Plate 3-1--Surface Facilities and Plate 1-1--Permit Boundary. These include the concrete ruins of several abandoned buildings, a substation, a short segment of power line which feeds the substation and continues to the west, a short, gravel surfaced segment of Utah State Highway 139, and an unimproved dirt road which starts at the state highway, crosses the southwest corner of the permit area, and continues to the northwest. There are no major electric transmission lines, pipelines, agricultural drainage tile fields, or occupied buildings in or within 1,000 feet of the permit area.

All boundaries of lands and names of present owners of record of those lands, both surface and subsurface, included in or contiguous to the permit area, are shown on Plate 4-1--Land Use and on Figure 4-1--Surface Ownership (page 4-4) and Figure 4-2--Coal Ownership (page 4-5).

Well Maps

There are no gas or oil wells within, and no water wells within or adjacent to, the proposed permit area, as shown by Plate 3-1--Surface Facilities and Plate 1-1--Permit Boundary. These maps, as stated above, show all surface and subsurface manmade features within and adjacent to the permit area. Three water monitoring wells were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. These wells are shown on Plate 7-1.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

OPERATION PLAN

OPERATION PLAN**MINING OPERATIONS AND FACILITIES**

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Type and Method of Mining Operations**Analysis:**

The permittee proposes to do all mining with room-and-pillar mining methods. First mining only will be done to protect all entries, mains and no subsidence areas. The no subsidence zone is the buffer zone around Beaver Creek. Second mining will be done to maximize coal recovery when possible.

Findings:

The requirements of this section of the regulations are considered adequate in regard to the proposed permit changes for the addition of the permit boundary to include part of the federal coal lease UTU-74804.

EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

Analysis:

All surface structures for this SR should remain status quo and are shown in the MRP.

Findings:

Sufficient information has been submitted to address this section.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR 784.17; R645-301-411.

Analysis:

No public parks or historic places will be impacted as a result of this SR.

Findings:

The applicant has submitted information in the previous permit application to address this section.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Analysis:

No new roads will be developed or relocated in relation to developing the SR.

Findings:

Sufficient material has been submitted to make a determination on this matter.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244.

Analysis:

Chapter 3 section 3.4.7 of the current operation and reclamation provides for the protection of air quality. Since there is no surface disturbance associated with this federal lease addition the current air pollution control plan is adequate.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

Since the permittee proposed to add a federal coal lease to the permit area they must get approval for the coal recovery plan from the BLM. The BLM has approved the R2P2 (resource recovery and protection plan) for the additional lease area. The Division relies on the findings in the R2P2 when evaluating the coal recovery plan. Therefore, the permittee has submitted the R2P2.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable resources survey

Hydrologic and vegetative renewable resources are the in the permit boundary. Seeps and springs also exist in the permit area. Beaver Creek is the only perennial stream near the permit area. Plate 3-3 shows that the permit boundary and the 100-foot buffer zone for Beaver Creek that is beyond the permit boundary.

Subsidence control plan

Since the permit area contains renewable resource lands that could be damaged by subsidence the Division requires the permittee to supply the following information.

- The type of mining method that the permittee will use is room-and-pillar. Second mining will occur in areas that can be safely subsided. Plate 3-3 shows the timing and sequence of mining.
- Plate 3-3, Mine Plan and Subsidence Monitoring Points, shows the location of current and proposed mine workings. The areas of first mining only and second mining are shown on Plate 3-3. The permittee shows the extent of second mining areas but does not show the limits of subsidence. The Division is concerned that subsidence will occur outside the permit boundary since second mining will occur on the west border of the permit area.
- The permittee listed the physical conditions that are likely to affect subsidence.
- The permittee shows the existing and proposed subsidence monitoring stations on Plate 3-3. The permittee proposes to have 1 base station in the permit area 1 base station outside the permit area. The permittee proposes to have 3 monitoring stations inside the permit area and an equal number outside the area.

The Division reviewed the location of the monitoring stations and the critical areas for subsidence. The critical areas for subsidence monitoring are along the permit boundary with particular interest in Beaver Creek. The permittee proposes to have monitoring stations along the western edge of the permit boundary where second mining is scheduled to occur up to the permit boundary.

- The permittee will protect no subsidence zones by first mining only. In first mining the permittee committed to leaving no less than 48% of the coal in the pillars. The Division usually considers leaving that amount of coal adequate to prevent subsidence.

- In Section 3.4.8.4 (Subsidence) the permittee described the past mining practices in the surrounding areas and the measured effects of planned subsidence. Past subsidence did not cause any surface damage. The permittee also maintains that since many beds of swelling shale under lie Beaver Creek that fractures would be self sealing.
- If subsidence damages water resources, the permittee committed to develop a mitigation plan with Water Rights and the Division. Mitigation plans for damage to water rights usually include the purchase of the damaged water rights or replacement.

If subsidence caused surface cracks or depressions then the permittee would fill the fractures or grade the depression. Should damage occur to vegetation then the permittee committed to revegetate the damaged sites.

Findings:

Information provided in the proposed amendment is considered adequate to meet the requirements of this section.

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

Analysis:

The SR proposal extends the underground operations. There is no change to the approved reclamation plans.

Findings:

The applicant has submitted sufficient information to address this section.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and enhancement plan

A description of the wildlife mitigation and management plan is located in section 10.5 of the current operation and reclamation plan. Potential impacts from mining would be best characterized as habitat loss. Since there will be no surface disturbance the only potential impact would be habitat loss resulting from subsidence. The 2000 raptor survey provided by the applicant shows the existence of one

OPERATION PLAN

active Kestrel nest, one inactive Golden Eagle nest and one Golden Eagle old/dilapidated nest. Plate 10-1 also identifies two unoccupied Golden Eagle nests. The applicant has proposed to verify the status of the identified raptor nests prior to full pillar extraction being completed within 500' of an active nest. Should a nest be active, mining practices will provide for a 200' barrier around the nest location. A 100' barrier will be provided around inactive nest locations. Nests lost or damaged due to subsidence or other mine related causes will be replaced under the guidelines and assistance from The Division of Wildlife Resources.

Endangered and threatened species

The list of threatened, endangered and candidate species that may occur within the proposed lease area are the Bald Eagle, Black-Footed Ferret, Bonytail Chub, Colorado Pike Minnow, Humpback Chub, and Razorback Sucker. They are listed in table 10-1 of chapter 10 of the current operation and reclamation plan. Most threatened or endangered species that could occur in Carbon County occur at lower elevations than the mine and have no habitat in the proposed permit area expansion. There have been no confirmed sightings of Black-Footed Ferrets in Carbon County in several years. However, the mine has potential, through water depletions, of adversely affecting four listed threatened and endangered fish species of the upper Colorado River drainage. The Fish and Wildlife Service requires mitigation when water depletions exceed 100 acre-feet annually. Chapter 7, section 7.3.2 (PHC Determination), provides for the criteria and volumes used to calculate an estimate of 60 acre feet of water per year.

Bald and golden eagles

Bald eagles are common in the area during the winter and could occasionally fly through or roost in the proposed addition to the permit area. Mining would have negligible effects on these birds.

Wetlands and habitats of unusually high value for fish and wildlife

Beaver Creek and several springs and ponds are adjacent to or lie within the proposed permit area revision. The applicant is currently monitoring Beaver Creek and certain springs, and wells in the proposed addition to the permit area., (plate7-1). The applicant has proposed to maintain a 100' Buffer zone along beaver Creek to prevent impacts to the stream. Subsidence monitoring points are identified on plate 3-3

Findings:

The information contained in this section of the application is adequate to meet the requirements of the regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Plate 3-1 shows the planned surface facilities. Section 3.5.2 states that during any future disturbance, topsoil will be stockpiled, contoured, fertilized and vegetated with seed mix #1 (Table 3-2). The piles will be protected with markers and berms or strawbales. And (section 3.4.4) that disturbed soils will be carefully handled for use as substitute topsoil materials. There is no change to the approved operations plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Analysis:

Chapter 9 of the current operation and reclamation plan provides the vegetation resource information. Plate 9-1 depicting the vegetative communities and acreage has been updated to include the proposed lease area. Vegetative communities include Oakbrush, Salina Wildrye, Maple/Oakbrush/Aspen, Fir/aspen, Alpine Herb/Grassland, Manzanita, and Sagebrush/grass/Rabbitbrush. This information is adequate to predict the potential for reestablishing vegetation. No surface disturbance is anticipated other than minimal subsidence. Mining practices would have a minimal effect on the vegetation resources. Potential impacts to vegetation caused by subsidence during active mining operations may be mitigated by implementing Contemporaneous reclamation practices as described in section 3.5.1 of the reclamation plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

There is no change to the approved operating plan.

Disposal of noncoal waste

Section 3.2.3 *Surface Facilities* indicates that there will be no disposal of non-coal waste on site other than rock type construction materials. And further that the disposal of rock-type construction materials will be disposed of in underground workings within the Horizon Mine, not on the surface. Garbage will be hauled to the state-approved landfill (section 3.2.3.8).

Coal mine waste

Section 3.2.3.100 states that no coal mine waste disposal facilities will exist on the surface in the permit area. Section 3.2.600 indicates that coal mine waste will be handled as outlined in this section and previously in this MRP. Section 3.2.3 *Surface Facilities*. Indicates that underground development waste will be disposed of underground with the Horizon Mine. If waste is brought to the surface, a permanent stockpile will be permitted.

Section 3.3.2.5 states that approximately 2500 CY of coal mine waste was buried in the facilities pad during construction. Appendix 3-8 contains a plate showing approximate locations of buried coal mine waste.

Refuse piles

Section 3.2.3.500 no refuse piles will exist in the permit area. Section 3.2.600 *Coal Mine Waste* indicates that underground development waste will be disposed of underground in a dry state. The acid-toxic nature of the material is discussed in Chapter 6.

Plate 3-1 shows the location of the sediment pond and ditch clean out material (behind the substation and behind the fan). The designated areas can hold 260 CY. The material may be sampled for use as substitute topsoil or fill material.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Soils at the site tend to be silty clay loam to loam within the Shupert-Winetti Complex and gravelly loam to loam within the Brycan, Rabbitex, Senchert and Curecanti Series. The SCS information the use of hydrologic groups B and C (undisturbed soils) are considered adequate. In cases where the soil phases were in group B or C the operator used group B.

The operator has used a CN of 89 for the undisturbed areas. This number is adequate at this time. However, should the operator propose additional buildings, road surfacing or pad surfacing the design CN would require re-analysis. The operator used a CN of 70 for the additional areas draining to the pond considered "undisturbed" by the operator. Some of these areas are disturbed from previous mining operations.

Groundwater Monitoring

Table 3.1
Operational Spring Water Sampling

Sampling Point	Location	Formation	Monitored Frequency	Water Parameters	Comments
SP-1	Channel in North Fork of Gordon Creek/Marakis spring	Blackhawk sandstone unit above coal seams	Quarterly (when accessible)	Flow/ Parameters Table 7-2	Spring sampling should be done at source when at base flow. Location relative to numerous springs in area is not identifiable on map.
SP-2 1989 through 1993	Right Middle Fork North Fork Gordon Creek Hillside out of Creek Bottom	Blackhawk	Quarterly (when accessible)	Flow/ Parameters Table 7-2	Spring flows through alluvium below the point of origin.
SP-4 1989 through 1993	North Fork Gordon Creek Drainage bottom	Not presented	Quarterly (when accessible)		
SP-9			Not discussed		

Table 3.2
Operational Groundwater Sampling

Sampling Point	Location	Frequency	Water Quality Parameters	Water Quantity	Comments
Sustained in mine flows as close to point of issuance as possible	where exceeding 1 gpm for at least 30 days	Quarterly while accessible	Identified in Table 7-2	yes Table 7-1	2 year review period
Discharge d mine water	If necessary treated in underground sumps or the Sedimentation Pond. Currently not expected and not a permitted activity. Will need permit approval if it occurs.	In accordance with permit.	In accordance with permit.	In accordance with permit.	Should be conducted in accordance with UPDES permit according to emergency discharge clause.
Well HZ-1 HZ-1S HZ-2 HZ-3	Completed into the Starpoint Sandstone	Quarterly while accessible	none proposed	Water level corrected to depth from ground surface	

The operator committed to submit quarterly and annual reports. These reports should be in the format required by the Division memo regarding annual report submittals, as is forwarded to the operators under R645-301-742.420. The operator is required to provide the information requested by the Division. The operator includes a commitment to notify the Division if data indicate non-compliance with permit conditions.

The operator has not adequately described how surface data sites will be used to determine the PHC of mining. The operator has stated that springs monitoring data will provide information or impacts to localized perched aquifers within the Blackhawk Formation. It is established that these aquifers are associated with fault systems. The description of monitoring based on hydrologic impacts should be further expanded upon. Similar information will be obtained by monitoring inflows. The HZ monitoring wells will assist in evaluation potential losses of ground water from the Blackhawk Starpoint Aquifer. See discussions under

Environmental Resource Description, Hydrology

Specifics in monitoring during the construction period were included and the operator has committed to collect weekly samples during the operational and reclamation construction period up stream and downstream of construction. The parameter is to be analyzed in the field is turbidity.

Proposed operational surface water monitoring is summarized in the following table:

Table 3.3
Operational Surface Water Monitoring

Sampling Point	Location	Flow	Water Quantity and Water Quality	Water Quantity	Comments
#3	Channel in Jewkes Creek /below disturbed area upstream of the intersection with the North Fork Gordon Creek and below the bypass culvert	Intermittent	Quarterly According to Table 7-5	Quarterly	
#5	Jewkes Creek upstream of disturbed area but downstream of the confluence with Spring Two Canyon.	Perennial	Quarterly According to Table 7-5	Monthly	
#6	Portal Canyon Drainage and Spring Two Canyon Drainage	Ephemeral	Not proposed	Not proposed	These sites should be monitored on the same day as sites 3 and 7 when sampling during a precipitation event or snowmelt period
#7	Beaver Creek above pond upstream of the permit area outside of potential subsidence zone.	Perennial Monthly	Quarterly According to Table 7-5	Late Spring gpm Late Summer/Fall gpm	

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Sampling Point	Location	Flow	Water Quantity and Water Quality	Water Quantity	Comments
#8	Beaver Creek downstream north east of permit area. Out of potential subsidence zone.	Perennial Monthly	Quarterly According to Table 7-5		Bear Creek is dry below surface water monitoring point 8 as shown in Appendix 7-5 "Historic Mine Development" map 8. This section of the stream is affected by the Fish Creek Fault and Graben.
2-2-W	Gordon Creek above confluence of North Fork Gordon Creek below the Hiawatha	Perennial Monthly	not proposed		Impact more likely to be below confluence because of fracture system.
2-3-W	Beaver Creek	Perennial Monthly	not proposed		Currently monitored by Beaver Creek Coal previously proposed to be monitored by Horizon. Not found on any map
2-4-W	Beaver Creek 1 -1/2 mile west of permit area	Perennial Monthly	not proposed	Flume installed	Currently monitored by Beaver Creek Coal previously proposed to be monitored by Horizon.

Surface-water monitoring

Discharges of water from this operation will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U. S. Environmental Protection Agency set forth in 40 CFR Part 434. See Sections 731 and 742.

Acid and toxic-forming materials

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by implementation of a Spill Prevention Control and Countermeasure (SPCC) Plan and by the following:

Potentially acid- or toxic-forming materials will be identified by use of Material Safety Data Sheets (MSDS), or by direct sampling and analysis in the case of underground development waste.

The operator has indicated that overburden and underburden samples will be gathered at 2,000 foot intervals throughout the mine and tested according to the Division requirements (Section 6.5.7.1). The Division understands this statement to mean the operator will test the materials according to current Division guidelines for acid and toxic forming materials. See further discussions under **Acid and Toxic** headings of this T.A.

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Transfer of wells

There are presently three monitoring wells on this permit. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations .

Discharges into an underground mine

There are no plans to discharge any water into an underground mine.

Gravity discharges

Based on historical data from other mines in the area, some mine water can be expected to be encountered during the mining operation. Typically, such water is stored in "sumps" or designated areas in the mine and used for mining operations or discharged to the surface.

Water quality standards and effluent limitations

Any discharge will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

Appendix 3-7 provides information about the Utah Pollutant Discharge Elimination System (UPDES), general discharge permit for coal mining. The UPDES discharge permit UTG 040019, became effective July 15, 1999 and will expire on April 30, 2003. Two sites are identified under the permit, outfall 001, minewater discharge from the sedimentation pond to Jewkes Creek and 002, mine discharge outfall to Jewkes Creek, which indicates the Department of Environmental Quality (DEQ) accepted the use of sumps for treatment of minewater.

With the minewater being directly discharged to the bypass culvert. It will be difficult to determine the visual permitting requirements as the discharge will mix with Jewkes Creek water before exiting the bypass culvert. Additional monitoring requirements required by the Division included: 1) collecting quarterly monitoring data from locations upstream and downstream from the disturbed area within a reasonable time on the same day, the minewater discharge sample is obtained, and 2) monitoring for the monthly maximum discharge flow rate as well as providing in-mine water consumption estimates.

The operator included a commitment to monitor discharge 002 on the same day during the quarterly sampling of surface water sites SS-3 and SS-5 according to the monthly UPDES discharge permit to meet the Divisions Requirement. The maximum flow for the discharge point each month required by the UPDES permit.

Information on mine consumption was provided as an estimate for full production. Information providing an estimate of use for each month during production was what was intended by the requirement to get a better idea on total minewater inflow. The monthly estimates can be incorporated during future mine plan amendment changes.

Diversions

Undisturbed

All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300. Details are described under those respective sections of this chapter.

Culvert details are provided in Chapter 7. Undisturbed area culvert UC-1 will receive bypass drainage from culverts UC-2 and UC-3, Portal Canyon and Jewkes Creek. The culverts are designed to pass the peak flow resulting from the 100 yr.- 6 hr. precipitation event. Calculations supporting these designs are presented in Appendix 7-4. The combined discharge for the two drainages that will be passed through UC-1 is 27.9 cfs. The 100 yr.-6 hr. peak flow to reach UC-2 is calculated to be 8.3 cfs, and the peak flow calculated at UC-2 is 19.6 cfs. Culverts

Calculations indicate that the flow capacity of the unaltered Jewkes Creek is 27.7 cfs above culvert UC-3 and 38.7 cfs below UC-1. The design capacities of the two culverts are 69.5 cfs and 100

cfs, respectively. The capacities of the culverts exceed the expected high capacity of Jewkes Creek. Culvert capacity for UC-2 is calculated to be 83 cfs. This capacity exceeds the Portal Canyon capacity of 13.1 cfs above the culvert in its unaltered state.

A trash rack has been installed on culvert UC-2. A generalized drawing of the trash rack is shown in Figure 7-8. There is no mention of a trash rack installed on UC-2 and no mention of a face protection at the culvert inlet. These culverts are temporary and will be removed during the reclamation phase.

Undisturbed diversions are described in the following table. All undisturbed and disturbed diversions are designed to carry the flow from a 10-year, 6-hour event. Culverts UC-4 and UC-5 receive drainage coming from the Jewkes Creek, an intermittent stream, designed to carry the flow from a 100 year - 6 hour event. The operator provided culvert sizes that may carry greater flows than the designed flow for the 10-year, 6-hour event.

Table 3.4
Undisturbed Drainage Diversions

Diversion	Ditch (D) or Culvert ©	Diameter (culvert)	Function
UC-1	C	24"	Collects flow from UD-4 and UD-5 and Portal Canyon and routes it into UC-3.
UC-2	C	36"	Collects flow from UD-3 and routes it into UC-3.
UC-3	C	36"	Collects flow from UC-1 and UC-2 and routes it into UC-5.
UC-4	C	24"	Collects flow from UD-2 and from Left Fork North Fork and routes it into UC-5.
UC-5	C	24"	Collects all undisturbed flow from UC-3 and UC-4, bypasses sediment pond, and discharges it into main drainage.
UC-6	C	42"	Carries flow of main drainage (all undisturbed flow) beneath haul road and into Gordon Creek drainage.
UD-1	D	--	Collects runoff from area above topsoil stockpile and routes it into road ditch of Carbon County Road 290.
UD-2	D	--	Collects runoff from above coal stockpile and handling area and routes it into Jewkes Creek above UC-2.
UD-3	D	--	Collects runoff from area above the portal area on south east side of Portal canyon and routes it along the south and east side to a natural channel below the operations then to Jewkes Creek.

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Diversion	Ditch (D) or Culvert ©	Diameter (culvert)	Function
UD-4	D	--	Collects runoff from area above the portal area on the north side of Portal Canyon to the disturbed area below the operations.
UD-5	D	--	Collects flow from above the disturbed area in Portal Canyon and routes it into bypass culvert UC-1.

Disturbed area diversions are designed to handle the 10-year, 6-hour event and are described in Table 7. Many of the undisturbed drainage ditches are proposed to be designed with an elevated berm. Most of these berms are located where undisturbed drainage is routed around the mine site. While most disturbed area diversions built with a berm are less likely to be an environmental problem, because drainage would still reach the pond if there was a failure, failure of a bermed undisturbed area ditches would send water to the sedimentation pond which is not designed to receive and treat those waters. More prudent designs, including improved grading plans, could be conducted to meet the design requirements rather than building elevated berms for water control. Since the pond is designed to contain or treat the 10 year - 24 hour event, it would be prudent to design the undisturbed bermed diversion drainages to safely handle the flow velocity and volume from a 10 year -24 hour event. If the ditches fail with a peak flow smaller than the 10 year - 24 hour event, the operator would have failed to adequately treat the run off from the disturbed area 10 year- 24 hour event through their pond.

The operator has provided a general channel configuration in Figure 7-7. The operator has stated that channel configuration may vary but the minimum cross sectional area will remain the same. While the channel may continue to meet design volume requirements with this statement, the stability of the design may not be prudent for slopes greater than 2:1 for certain geologic materials under certain conditions. It would be more prudent for the operator to provide a range of acceptable configurations through specific types of geologic materials and commit to maintain these ditches should they fall out of the acceptable range. Additionally, the typical designs do not match the descriptions provided for the ditches. The proposed designs are likely to require high maintenance. However, the operator has met minimum design requirements.

Disturbed

There are five diversion ditches that collect the disturbed area runoff. Most disturbed area runoff will be directed to the sedimentation pond. Only two small areas at the upper end of the disturbed area will use alternative sediment control. Table 7-7 provides the sizing and characteristics of the disturbed diversions. Most of the disturbed area drainage will be collected by ditch DD-1, on the southwest side of the disturbed area. This diversion consist of eight segments. The location of diversion ditches in relation to the minesite are shown on Plate 7-4.

Disturbed area culverts are used in conjunction with diversions to convey runoff beneath roadways and to the lower minepad. Table 7-8 provides the sizing and characteristics of the culverts on the minepad. Culvert DC-1 is 18 inches in diameter and was installed to carry runoff between DD-1F and DD-1G, under the access road to the temporary office and substation. Culvert DD-2, also 18 inches, was installed to convey runoff under the coal loadout and main facility roadway.

The operator considers any flow velocities less than 5 feet per second (fps) as non-erosive flows. However, in the literature there are values which indicate velocities less than 5 feet per second are erosive with earthen ditches that have erosive soil types. The operator has not considered soil type in the determination of erosive velocities. In some cases vegetation will be adequate to control erosion. Degradation and additional erosion control needs for drainages within the pad area draining to the sedimentation pond will be determined through site inspection. Where velocities exceed 5 fps designs must be implemented to minimize erosion.

Drainages are developed by the operator to route undisturbed drainage around the site channels. Drainages with slopes up to 0.5 feet/foot have failed when riprapped. Riprap design procedures were not based on slopes of this steepness. Adequate grading, fill and angular riprap and filter blanket designs are necessary. The operator has provided sizing for graded riprap but no filter blanket designs. It is the opinion of the Division that the operator has not minimized potential impacts to the adjacent area and undisturbed drainage slopes should be reduced where possible.

The proposed topsoil pile directs drainage from DD-3 to DC-2 into the sedimentation pond. No drainage designs specific to road drainage could be located.

Table 3.5
Disturbed Drainage Diversions

Diversion	Ditch (D) or Culvert ©	Diameter (culvert)	Function
D-1	D	--	Collects runoff from entire No. 1 and No. 2 Mine areas and routes it into the sediment pond. according to Appendix 3-3 the portal bench will drain to D1
DC-1	C	12"	Collects runoff from area below the facilities pad and routes it beneath the haul road and into the sediment pond.
DC-2	C	12"	Collects runoff from the topsoil stockpile area and routes it beneath the haul road and into the sediment pond.

Stream buffer zones

The operator has submitted a stream alteration permit to the Division of Water Rights. The submittal proposes a 3 foot and 2 foot culvert respectively in Jewkes and Portal Canyon. Comments on the proposal were due by May 19, 1996.

Sediment control measures

The operator proposes to begin site construction prior to installation of the sediment pond. During this period alternative sediment control measures are proposed to be used. Straw bales and silt

fences are proposed to be placed in the stream channels of Portal and Spring Two Canyon Fork to capture sediment. Berms, straw bale dikes and silt fences will be located between stream channels and areas being disturbed. The operator has committed to cleaning these structures once construction is completed using backhoes and shovels.

The culvert is proposed to be installed from the lower end of the pad in an upstream direction. Horizon Coal Company has committed to limit construction to periods when the stream is not flowing to the extent possible. Stream flow will be bypassed around construction activities using a diversion dike and flexible culvert. The operator has committed to construct the sedimentation pond as soon as possible following construction of the downstream culvert sections and must obtain a stream alteration permit prior to approval.

The proposed measures for culvert construction are acceptable practices. The ability of these proposed measures to control sediment can only be judged in the field by inspection and technical staff and will be determined adequate based on the ability to meet the performance standards and requirements of R645-301-745.111.

Roads are proposed to be surfaced with 12 inches of crushed gravel road base. These roads are proposed to be crowned and therefore the east portion of the road from the crown at the south end to the limit of the sedimentation pond will drain toward the creek. The main access road will be 20 feet wide not to exceed a 6% vertical grade. Highwalls near the first bend will be 0.33H:1V degrees and 1.2H:1V following removal. Maximum embankment height is 100 feet at 40 degrees and maximum slope height is 50 feet at 32 degrees. Appendix 3.3 indicates the road will be sloped toward the disturbed drainage ditches. This conflicts with the road surfacing designs.

Ditch UD-2 receives extensive drainage from cut slopes as shown in Plate 3-7A, cross sections E, F, and G. These slopes are steep and can be significant sources of sediment. The operator has committed to provide erosion control matting and seeding according to Table 3-2, for all cut slopes which will drain directly to an undisturbed area diversion. As presented in Section 3.3.5.3 mulching and roughening will occur on areas before seeding where slopes are 2½:1 or less. The matting will be applied on slopes 2½:1 or steeper. It should be noted that where competent bedrock is exposed matting may not be practicable.

Currently this road is located on the east side of the stream and outside the permit area, and therefore is a potential source of additional sediment to the stream flow. The fan portal road is to be considered an ancillary road and will be cut into native materials without an engineered surface.

The topsoil is also proposed to be vegetated with interim cover as discussed in Sections 3.4.4.1, page 3-19 and Section 3.5.2. The piles will be contoured, fertilized and seeded. A berm will be placed around each topsoil pile to minimize soil transport. Prior to achieving adequate vegetation establishment other measures are necessary to control erosion.

Siltation structures

Sediment ponds and all other treatment facilities are defined as siltation structures. The two siltation structure at this site include Sweets Pond, a pond developed for water rights use, and the

sedimentation pond. For a discussion of the mine site sedimentation pond, see the **Sedimentation Ponds** heading below.

Sweets Pond currently is associated with the Gordon Creek Mines 2, 7, and 8. This site would be double permitted until Gordon Creek has obtained bond release. Because this is an impoundment to be associated with the Horizon Mine appropriate regulatory requirements must be addressed.

Sweets Pond also has an existing pumphouse and a water gate to control inlet flows. The operator has proposed to build a water line from the pond to the mine. This should be included in the permit area as part of the disturbed area. The pond itself need not be part of the permit area for which bonding is required as described under the "Disturbed Area" and "Permit Area" definition in R645-100, as long as the structures are constructed and maintained in accordance with R645-301 and R645-302.

Sedimentation ponds

There will be only one sediment pond. The sediment pond will be a non-MSHA structure. The sediment pond will be inspected during and after construction by a qualified, registered, professional engineer. The pond will be inspected after each storm and cleaned as necessary. Its embankments will be vegetated, to control erosion, with a temporary seed mix as described in Section 3.5.5.2.

The operator has analyzed the pond embankment designs for stability. Using a standard, circular failure model and the Hoeck Circular Failure Charts, the operator has found that the pond embankments have a static safety factor of 4.81 for dry conditions and 4.44 for saturated conditions (Appendix 3).

The operator proposes to divert all disturbed area run off to the sedimentation pond, including the proposed north return air fan, receiving runoff from 10.7 acres (Appendix 7-4). The sedimentation pond will be mostly incised except at the downstream face, which will be an earthen embankment. The pond has been designed to contain the runoff from a 10-year, 24-hour precipitation event calculated to be 0.83 acre-feet. The permit area surfacing is described as a gravel parking lot. The full extent of gravel is not defined.

The operator has assumed sediment production of 0.05 acre feet/acre from the disturbed area. The operator has not provided a technical method or calculation to determine where the 0.05 acre feet/acre comes from, Appendix 7-4. However, the final design allowed 1.48 acre-feet for maximum sediment storage, which is closer to 0.1 acre foot/acre per year sediment production for disturbed areas and is considered a conservative estimate. Although the maximum sediment storage is considered adequate at this time, if the operator should need additional increases in the sedimentation pond capacity the 0.05 acre feet/acre will not be considered valid until demonstrated to meet standard through accepted design methods. The operator must remove the discussions of excess design capacity or provide technical design information.

The total capacity of the pond below its emergency spillway will be 2.3 acre-feet. The sediment will be cleaned out of the pond at 60% of the total sediment volume, or 0.88 acre-feet. The cleanout volume will be marked by a calibrated pole. One pole is generally not adequate to determine sediment capacity because the sediment tends to be deposited in deltaic form at the inlets. The operator will be expected to maintain the capacity required for runoff volume.

The pond will also have a 2" decant pipe with a locking valve. Twenty-four hours after a storm, the pond is to be drained by opening the valve on the two inch decant line in the pond. This valve is to remain locked at all times except when decanting storm runoff. The inlet of the decant line is to be located at an elevation of 7576.0 feet, which is 24 inches above the 60% cleanout level and 3.4 feet below the elevation of the spillway.

Should the quantity of water encountered in mining exceed the amount required by the underground operations the operator proposes the water be treated by the sediment pond in order to meet effluent standards. This action may be used as an emergency measure but is not an approved design. The use of the pond for this purpose would need to be approved prior to handling any runoff which might exceed the design requirements.

The sediment pond's spillway is designed to pass the peak flow of the 25-year, 6-hour precipitation event. Calculations for the spillway assume the pond is full to the elevation of the spillway prior to the onset of the event. With a depth of 2.3 feet, a width of 10 feet and side slopes of 2h:1v, the spillway will have 2 foot of freeboard between the top of the pond embankment and the maximum flow elevation. The operator designed a non-erodible, open channel emergency spillway for which the outlet will have a riprap with a D50 of 4 inches. However, no filter blanket designs were included.

Although the spillway designs meet the requirements of a single -open channel spillway design under R645-301-743.00, the spillway does not provide the protection of aquatic life through providing an oil skimmer. Since this pond will be receiving oils and grease from the site the pond should provide for some type of oil skimmer.

Pond designs, maps and calculations have been prepared under the direction and certification of Richard H. White (State of Utah, Registered Professional Engineer #7102). The information and calculations contained in Appendix 6E are also certified by Mr. White.

The pond safety factor calculations assume an 11 foot embankment height and a slope angle of 2H:1V (26.56 degrees). The soils are assumed to have soil cohesion and friction angle of 35 psi and 30 degrees respectively, which results in a safety factor of 4.81 dry and 4.44 saturated conditions.

Other treatment facilities

Two small areas above the disturbed area have been proposed for alternate sediment control. One area is at the upstream end of the topsoil stockpile in Portal Canyon, adjacent to the inlet of Culvert UC-2. This area slopes toward the culvert and will be treated with berms and straw bales. The second alternative sediment control area is the exterior embankment slopes of the sedimentation pond, which will be treated with a combination of straw bales and silt fence.

Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area and meet the effluent limitations under R645-301-751.

Exemptions for siltation structures

No exemptions requested by the operator.

Discharge structures

The sedimentation pond discharge structure is discussed under Siltation Structures.

Impoundments

No other treatment facilities are planned for this operation.

Casing and sealing of wells

The operator has stated that approvals and permits to drill wells will be received from the Division of Water Rights and appropriate Government agencies. The final casing and sealing of wells is discussed in more detail in the section entitled **MINE OPENINGS** under **RECLAMATION PLAN** below.

Findings:

The applicant has submitted sufficient information to address this section.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

Analysis:

All support facilities are described in the MRP. No support facilities will exist on the surface of the SR. Sufficient information concerning support facilities has been supplied in the MRP.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations..

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

Analysis:

Surfaces above the SR are private or inaccessible lands. No signs or markers other than water monitoring location markers will be installed. The applicant has supplied sufficient information for this section.

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Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations..

USE OF EXPLOSIVES

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

Analysis:

There will be no use of explosives above ground in the SR. The applicant has addressed the use of explosives in the MRP. Sufficient information has been submitted for this section.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:**Affected area maps**

Plate 1-1 shows the permit boundaries. The Division considers the permit boundary to be identical to the affected area. The Division reviewed the Plate 1-1 and found it to be adequate.

The boundaries of the disturbed area, as well as those of its component areas of previous and proposed disturbance, are shown adequately on Plates 3-1, 3-6, and 3-7.

Mining facilities maps

The locations and approximate dimensions of all mine facilities are shown on Plate 3-1--Surface Facilities. Included on this map are all buildings, portals, fans and earthen structures (pads, cuts and embankments), both of the large main drainage bypass culverts, the mine supply substation adjacent to the main portals, the large main substation at the mouth of the canyon, the Main Haul Road, the Hiawatha Fan Portal Access Road, the conveyor from the mine, the coal storage and loading facilities, the topsoil storage area and the sediment pond. This plate was certified in 1996, after its latest revision, by Richard B. White, a professional engineer registered in the state of Utah.

Design details of the sediment pond are shown on Plate 7-6--Sedimentation Pond Detail Map. This plate was certified in 1996 by Richard B. White, a professional engineer registered in the state of Utah.

Mine workings maps

The location and extent of all known abandoned underground mine workings, including mine openings to the surface within the proposed permit and adjacent areas, are shown on Plate 3-3--Five Year Mine Plan. There are no active underground mines and there has been no surface mining within the permit and adjacent areas.

Monitoring and sample location maps

Both geologic and groundwater information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Information on water quality and quantity was obtained from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Water Monitoring Locations.

Findings:

The applicant has submitted sufficient information to address this section.

RECLAMATION PLAN

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GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

The only surface disturbance that has occurred on the SR is the development of water monitoring wells. Plans have been presented in the MRP which describe how the wells will be reclaimed.

Findings:

The applicant has submitted sufficient information to address this section.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

No surface disturbance other than minimal subsidence will take place on the SR. The post mining land use for the area included in this application will remain the same as premining conditions i. e., grazing, logging, mining, recreation and wildlife habitat.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

Analysis:

No surface disturbance is anticipated other than minimal subsidence. Beaver Creek and several springs and ponds are adjacent to or lie within the proposed permit area. The applicant is currently monitoring Beaver Creek and certain springs, and wells in the proposed addition to the permit area.,

(plate7-1). The applicant has proposed to maintain a 100' Buffer zone along beaver Creek to prevent impacts to the stream. Subsidence will be monitored during mining and for a period of two years following final cessation of mining practices. The subsidence monitoring points are identified on plate 3-3 of the application.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The SR proposal extends the underground operations. There is no change to the approved reclamation plans. AOC will be met.

Findings:

The applicant has submitted sufficient information to address this section.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

Plate 3-1 shows the location of the sediment pond and ditch clean out material (behind the substation and behind the fan). The designated areas can hold 260 CY. The material may be sampled for use as substitute topsoil or fill material.

Contemporaneous reclamation is discussed in section 3.5. Plate A of Appendix 8-1 shows areas which were contemporaneously reclaimed in 1997. This work is discussed in section 8-8.

General plans for backfilling and grading are found in Section 3.5.4. Plates 3-7 and 3-7A show the topography post-mining. Cut and fill calculations are in Table 3-1. There is a 4,240 CY deficit which will require lowering the site 5 inches.

Findings:

There is no change from the approved reclamation plan.

RECLAMATION PLAN

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

No new mine openings are proposed under the SR. Closure and reclamation of mine openings is discussed in Section 3.5.3.1 (page 3-31).

Findings:

Mine Openings information for the Reclamation Plan is adequate to meet the requirements of this section.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Twenty inches of topsoil will be placed over 8.23 acres of graded fill (section 2.117). The figure of 9.15 acres was used for bonding purposes and is listed in (section 3.5.4 and Table 3-1). This amounts to approximately 14,417 CY of topsoil (section 3.5.4 and Appendix 8-1). There is no change from the approved reclamation plan.

Findings:

Sufficient information has been provided to meet this section of the regulations.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

No roads or transportation facilities will be affected as a result of the SR. The plan contains information to show that no roads or transportation facilities overly the proposed SR area. Sufficient in

Findings:

Sufficient information has been submitted to address this section.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Reclamation plans dealing with ground water are identified in the approved permit. The reclamation criteria extends to the SR area.

All surface and groundwater monitoring will continue throughout the reclamation period. The permittee will monitor for acid or toxic materials and provide treatment if adverse conditions occur. Wells will be sealed and the sites reclaimed. There will be no discharges into the underground mine. The mine will be sealed and no gravity discharge is expected. All diversions will be removed and flow distributed over the surface. Sediment control measures will be implemented using the best technology available during reclamation. Sediment pond will remain until vegetation is established and effluent limitations are met.

Findings:

The applicant has submitted sufficient information to address this section.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

No surface disturbance is anticipated other than minimal subsidence. Mining practices would have a minimal effect on the vegetation resources. Potential impacts to vegetation caused by subsidence during active mining operations may be mitigated by implementing contemporaneous reclamation practices as described in section 3.5.1 of the reclamation plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

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Analysis:

No surface disturbance is anticipated other than minimal subsidence. Mining practices would have a minimal effect on the vegetation resources. Potential impacts to vegetation caused by subsidence during active mining operations may be mitigated by implementing Contemporaneous reclamation practices as described in section 3.5.1 of the reclamation plan.

General requirements

The general requirements for revegetation are provided for in section 3.5 of the reclamation plan.

Timing

The approximate schedule for reclamation activities is outlined in table 3-4 of section 3.5.7.1 of the reclamation plan.

Mulching and other soil stabilizing practices.

Sections 3.5.4.3, 4.5.1.2, and 3 of the reclamation portion of the plan and proposal describe the mulching and other stabilizing practices to be implemented during reclamation.

Standards for success

The standards for success are provided for in section 3.5.6 of the reclamation plan.

Findings:

Information provided in the proposal is adequate to meet the requirements of this section of the regulations.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

The backfilling and grading schedule is detailed in section 3.5.7.1 and outlined in Table 3-4.

All acid-toxic material, exposed coal or refuse will be covered with 4 feet of material. The regraded surface will be scarified. Topsoil will be replaced.

Silt fences will be used at the bottom of fill slopes and along the reclamation channel during topsoil placement. The site will be seeded and mulched as described in section 3.5.5.3 (1 ton mulch/acre) and section 3.5.4. Erosion control matting on slopes 2½H:1V or greater and sediment controls will be placed as needed (Plate 7-7a; section 3.5.4.3).

Findings:

There has been no change to the approved reclamation plan

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

Analysis:

The SR proposal extends the underground operations. There is no change to the approved reclamation plans.

Findings:

The applicant has submitted sufficient information to address this section.

Ground-water monitoring

Analysis:

Both geologic and groundwater information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The locations of these sites are shown on Plate 6-1--Geology and Plate 7-1--Water Monitoring Locations.

Information on water quality and quantity was obtained from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Water Monitoring Locations.

Findings:

The applicant has submitted sufficient information to address this section.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Affected area boundary maps

Plate 1-1 shows the permit boundaries. The Division considers the permit boundary to be identical to the affected area. The Division reviewed the Plate 1-1 and found it to be adequate.

RECLAMATION PLAN

Bonded area map

Plate 1-1

Reclamation backfilling and grading maps

Plate 7-7A

Reclamation facilities maps

The SR proposal extends the underground operations. There is no change to the approved reclamation plans.

Final surface configuration maps

Plate 3-7 and 3-7A

Reclamation monitoring and sampling location maps

Both geologic and groundwater information were obtained from test borings done at sites designated LMC-1, LMC-2, LMC-3, and LMC-4. The elevations and locations of these sites are shown on Plate 6-1--Proposed No. 1 & 2 Mine Geologic/Structure Map, Plate 7-1--Hydrology Map, and Plate 7-2--Drill Hole Data of the Horizon Mine Area. These plates were certified in 1996, after their latest revision, by Richard B. White, a professional engineer registered in the state of Utah.

Information on water quality and quantity was obtained, and will continue to be obtained through final reclamation, from monitoring stations designated 1, 2, 3, 4, 5, 6, and 7. The elevations and locations of these sites are shown on Plate 7-1--Hydrology Map. This plate was certified in 1996, after its latest revision, by Richard B. White, a professional engineer registered in the state of Utah.

Vegetation information was obtained, and will continue to be obtained through final reclamation, from transects done at locations designated A through E. These locations are shown on Plate 9-2--Vegetation Map No. 2. This plate was certified in 1996, after its latest revision, by Richard B. White, a professional engineer registered in the state of Utah.

A network of subsidence monitoring stations will be established, subsidence data from which will be submitted to the Division with each Annual Report. Monuments will be steel rebar with aluminum caps. There will be a total of 26 stations: four base stations and 22 monitoring stations, five of which will be above Beaver Creek. The locations of all subsidence monitoring stations are shown on Plate 3-5--Subsidence Monitoring Plan. Plate 3-5 was certified in 1996, after its latest revision, by Richard B. White, a professional engineer registered in the state of Utah.

Reclamation surface and subsurface manmade features maps

Plate 3-1 shows surface contours of undisturbed areas adjacent to disturbed areas which are indicative of the original land slopes in the vicinity of the disturbed area and which were used to create the reclamation final contour maps Plates 3-7 and 3-7A. Plate 3-6 shows conditions prior to disturbance by Horizon.

Reclamation treatments maps

Plate 7-7A

Findings:

There has been no change to the approved reclamation plan.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

Form of bond (Reclamation Agreement)

The SR proposal extends the underground operations. There is no change to the approved reclamation plans.

Determination of bond amount

The Division reviewed the reclamation and found that no additional surface disturbance would take place. Therefore, the Division found that the bond does not have to be adjusted at this time.

Terms and conditions for liability insurance

The SR proposal extends the underground operations. There is no change to the approved reclamation plans. Liability insurance will continue.

Findings:

The applicant has submitted sufficient information to address this section.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

A cumulative hydrologic impact assessment will be compiled when all deficiencies are addressed.

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CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

UPPER GORDON CREEK AND BEAVER CREEK BASINS

Horizon Mine
C/007/020

Gordon Creek #2, #7 & #8 Mines
C/007/016

Gordon Creek #3 & # 6 Mines
C/007/017

Carbon County, Utah

February 23, 2001

I. INTRODUCTION

This Cumulative Hydrologic Impact Assessment (CHIA) is a findings document. It assesses the impacts likely to occur within a cumulative impact area (CIA), an area that identifies the limits mining will have any possible affect on the hydrologic regime.

Lodestar Energy, Inc. proposed a significant revision (SR) to their existing mineplan on August 21, 2000, which is the cause for the update of this CHIA. The SR expands the mining boundary northwest toward Beaver Creek. Mining will still take place in Federal Coal Lease UTU-74804 for which the operator has right of entry.

Lodestar Energy, Inc. limit was established at the creek, because the groundwater regime has not been characterized beyond that point, although the federal lease and coal reserves extend farther north. Well HZ-95-1 is just north of Beaver Creek, the northern most deep monitoring site. Current hydrologic information supplied by Lodestar indicates that there is no or very little connection of surface and groundwater for the proposed permit area. If Lodestar plans to mine further north into the federal lease, they must characterize the groundwater system and show there is no hydrologic connection between the springs and streams and deep groundwater aquifers.

The objectives of a CHIA document are to:

1. Identify the Cumulative Impact Area (CIA). (Part II)
2. Describe the hydrologic system and baseline conditions. (Part III)

3. Identify hydrologic resources in the impact area. (Part IV)
4. Identify standards against which predicted impacts can be compared. (Part V)
5. Estimate probable future impacts of mining activity. (Part VI)
6. Assess probable material damage. (Part VII)
7. Make a statement of findings. (Part VIII)

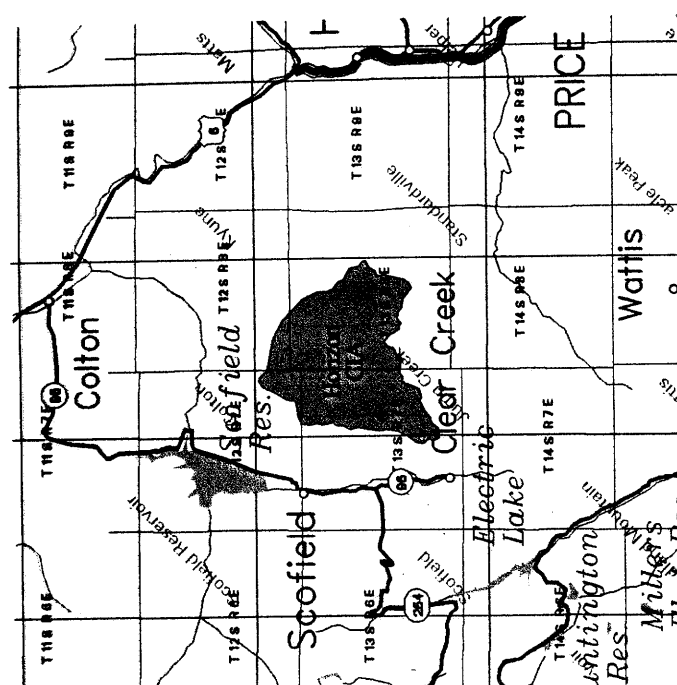
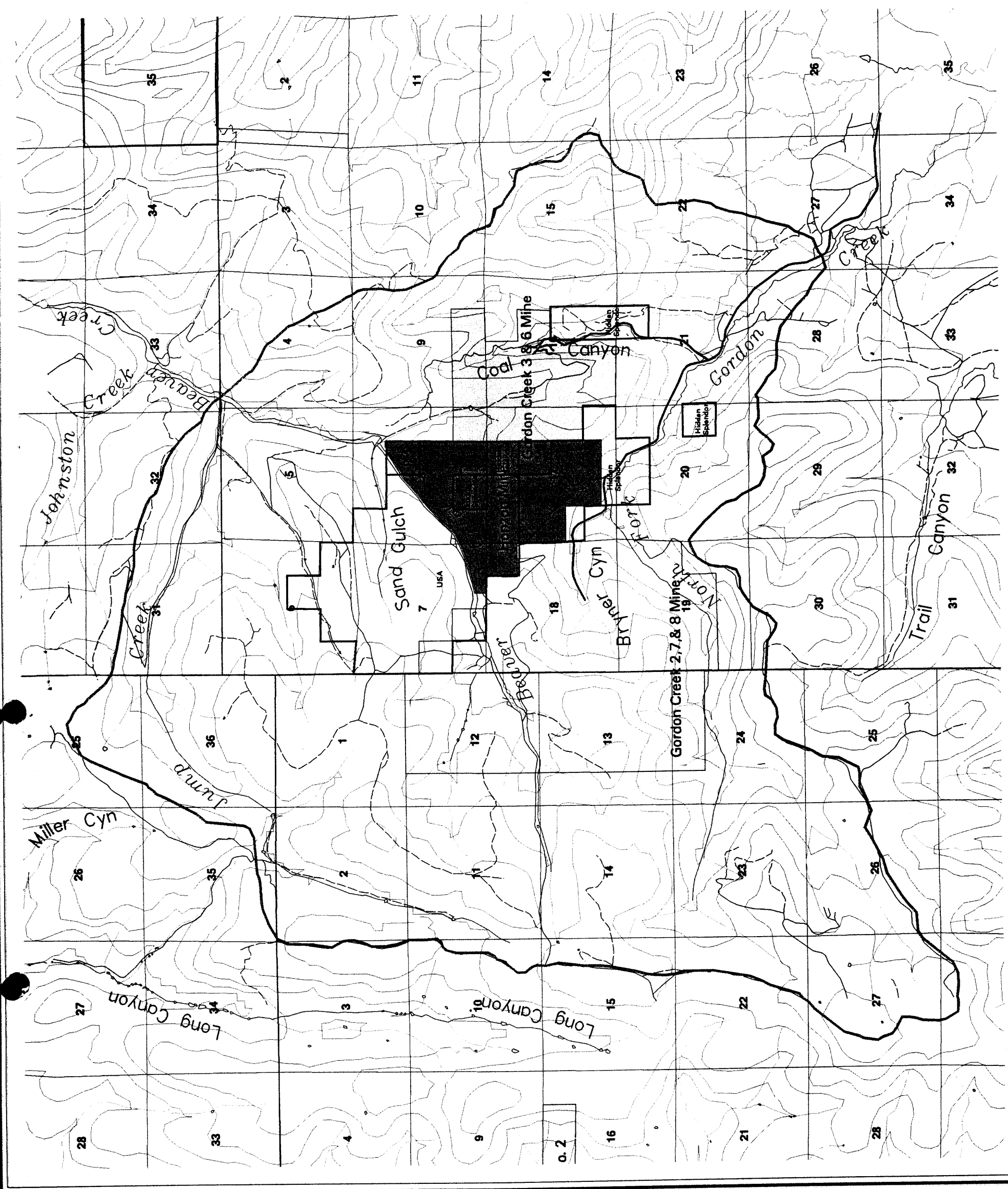
Material damage is not defined in either the Utah or Federal regulations. Criteria that are used to determine material damage to hydrologic resources in coal mining programs administered by other states or by the federal Office of Surface Mining (OSM) include:

- Actual or potential violation of water quality criteria established by federal, state or local jurisdictions.
- Changes to the hydrologic balance that would significantly affect actual or potential uses as designated by the regulatory authority.
- Reduction, loss, impairment, or preclusion of the utility of the resource to an existing or potential water user.
- Short term (completion of reclamation and bond release) impairment of actual water uses that cannot be mitigated.
- Significant actual or potential degradation of quantity or quality of surface water or important regional aquifers.

This CHIA has been prepared by the Utah Division of Oil, Gas, and Mining. It complies with Federal and Utah coal regulations as found in 30 CFR 784.14(f) and R645-301-729, respectively. The last CHIA for the area was prepared in September 24, 1996 for permitting the Horizon Mine. In addition to reference sources cited, information garnered from the Horizon Mine Permit Application Package (PAP), the Gordon Creek #2, #7 and #8 Mine PAP and the Gordon Creek #3 and #6 PAP as well as U. S. Geological Survey and Utah Geological Survey hydrologic reports.

III. CUMULATIVE IMPACT AREA (CIA)

The Cumulative Impact Area (CIA) is shown on **Figure 1**. This CIA identifies the Gordon Creek/Beaver Creek area, an area where anticipated and past coal mining activities could interact to affect the surface and ground-water resources. The extent of the CIA is determined on the potential for hydrologic resources, their recharge source and maximum offsite impacts by mining activities. Both surface and ground-water resources are considered in the CIA.



Location Map

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining

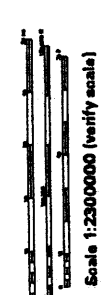


Figure 1
Cumulative Hydrologic Impact Assessment
Horizon Mine

CUMULATIVE IMPACT AREA (CIA)

File: horizcia.gra

Compiled by: Dan Smith Date: February 27, 2001

The groundwater boundary was chosen to incorporate mined and proposed lease areas, fault systems and potential mine expansion which could influence the hydrologic balance in the drainage where the mining activities are located and adjacent drainages.

The surface water boundary encompasses the Beaver Creek and the Gordon Creek watersheds, which are part of the Price River drainage basin. Beaver Creek flows in a northwest direction and discharges into the Price River south of Colton, Utah. Gordon Creek flows east and joins the Price River north of the city of Price, Utah.

A ground water CIA includes all areas between the anticipated mining operations and known aquifer discharge points. Groundwater is found in alluvial/colluvial, perched, and regional type aquifers, specifically the Star Point Sandstone. Alluvial/colluvial systems correspond closely with the stream channels. Shallow, perched aquifers are recharged within relatively small areas around the seeps and some springs. The extent of the regional type aquifer was established with the best information available. Variability in lithofacies and the high degree of faulting influence the flow and direction of the groundwater. The CIA exhibits extensive faulting with some offset over 100 feet. Mining in the Horizon Mine is planned to take place exclusively within the Jump Creek graben during the first five year permit term. The faults within the graben may act as conduits for groundwater movement. Monitoring sites have been established to identify any relationship between surface waters and ground-waters.

MINING HISTORY

Coal mining operations began in Upper Gordon Creek drainage of the Wasatch Plateau Coal Field in the early 1920's and continued at various locations except for some brief lulls. The more prominent mines in the CHIA produced more than 500,000 tons of bituminous coal, they were the Blue Blaze Mines (Consumers), Gordon Creek Mines, Sweets Mine, National Mine. Some less known mines such as the Davis Mine, K.L. Stores Mines, Success Mine, Jeffery Mine, New Ewing Mine and Western Mine operated in the area at various times until the early 1950's. Several small communities sprang to life in the canyons and the town such as Consumers and National. Consumers boasted a population of 5,000 inhabitants. Building remnants, debris and coal refuse from some of those mines still remain.

All mining in the CIA was and will be completed underground in the Hiawatha and Castlegate "A" Coal Seams, Table 1, using room and pillar mining techniques. Consumer's mines operated from 1924 until the 1940's in Consumers Canyon. The National Mine operated from 1928 until the 1950's in a canyon east of Consumers Canyon. The Sweet's mine operated from 1925 to 1950 from Sweet Canyon west and south of Consumers Canyon. The Swisher mines operated from Bryner Canyon. The Swisher #1 Mine opened in the 1960's on the south side of Bryner Canyon. The Swisher Mines were purchased by General Exploration and shortly afterward by Atlantic Richfield Company (ARCO) in 1980. ARCO operated the Gordon Creek #3 and #6 mines in Coal Canyon and the #2, #7 and #8 mines in Bryner Canyon through the 1990's.

Table 1.
Mines in Respective Coal Seams in the CIA.

Castlegate A Seam	Hiawatha Seam (Wattis Seam, Tabet, et al)
Blue Blaze #2 Mine	Sweet #1 Mine
Blue Blaze #3 Mine	National #1 Mine
Columbo Mine	Horizon(#1) Mine (Blue Blaze #1)
Gordon Creek #1 (Swisher #1)	Gordon Creek #3 Mine (Beaver Creek #3)
Gordon Creek #2 Mine (Swisher #2 Mine)	
Gordon Creek # 6 Mine	
Gordon Creek # 7 Mine	
Gordon Creek #8 Mine	

The Surface Mining Control and Reclamation Act (SMCRA), Title 95-87, became federal law in 1977. Minesites, such as the Blue Blaze Mines, National Mine and Swisher Mines, operated and closed prior to passage of SMCRA. The buildings, coal refuse and debris from the abandon mines was not required to conform to the reclamation requirements under Title V, but fell under the Abandon Mine Lands, Title IV.

The Gordon Creek #2, #3, #6, #7 and #8 mines and the Horizon Mine were operating after passage of SMCRA and required to meet statutory operational and reclamation performance standards under Title V requirements.

The disturbed areas of Gordon Creek #3 and #6 Mines have been reclaimed and final bond release granted in 1999. The Gordon Creek #2, #7 and #8 Mines are currently under reclamation and have met Phase 1 bond release, which consists of sealing the portals, backfill and regrade to approximate original contour (AOC), cover the regraded area with a topsoil or substitute topsoil, roughen and prepare the surface, reestablish drainages and revegetate the area using an approved seed mix. The Swisher #1 Mine was reclaimed by the Utah Abandon Mine Reclamation (AML) program in 1986. Construction of the Horizon Mine covered the refuse and debris of the Blueblaze Mines.

Utah's AML Program sealed and reclaimed five of the pre-SMCRA mines in the CIA during 1986.

The Gordon Creek Project, conducted reclamation which consisted of sealing portals, backfilling, regrading and revegetating the Sweet Mine, Swisher #1 Mine, National Mine, Success Mine and the Jeffery Mine. AML also conducted fire suppression work on the National Mine in the early 1980's before work could begin on the National and Jeffery Mines.

Proposed and Currently Operating Mines

Horizon Mine

Lodestar Energy, Inc.(Lodestar) is the owner and operator of the Horizon Mine. Lodestar purchased the coal lease rights from Horizon Coal Corporation/Horizon Mining, LLC, who in turn had acquired the leases from Hidden Splendor Resources. Lodestar bases its right to mine coal on acquisition of a lease from Hidden Splendor Resources and the Beaver Creek Lease UTU-74804. Horizon Mine was issued a Right-of-Way through BLM lands in 1996, which has since been incorporated into the Beaver Creek Lease.

Horizon Mine is 14 miles due west of Helper, Utah (**Figure 2**). The mine portals are located in the Portal Canyon a north east trending side canyon of Consumers Canyon. Portal Canyon is an ephemeral drainage that joins Consumers Canyon. Jewkes Creek flows down Consumers Canyon and discharges to the North Fork of Gordon Creek.

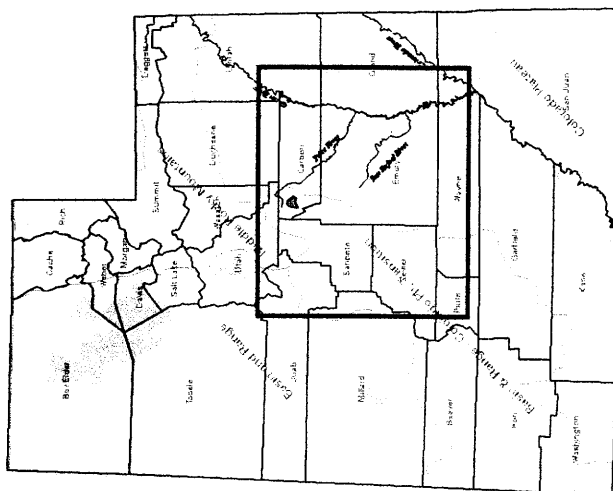
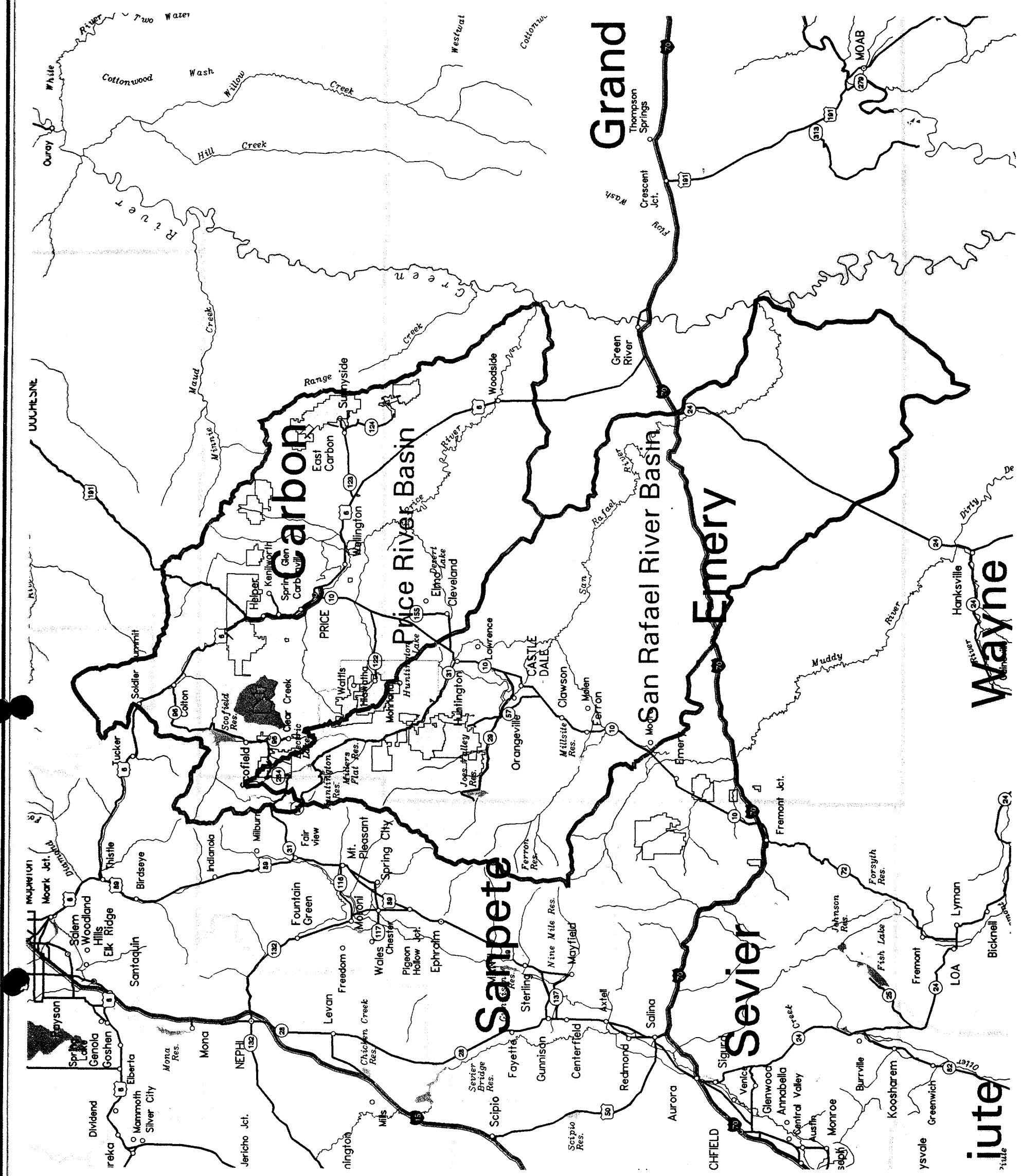
The proposed area to be added to the permit (406 acres), is smaller than the total area held in lease by Lodestar, which comprises approximately 1280 acres. Mining is being conducted in the Hiawatha (Wattis, according to Tabet et al) Seam.

Most recently, Lodestar Energy, Inc. has submitted plans to expand into their Federal Lease UTU-74804 up to the south side of Beaver Creek. This expansion is a significant revision (SR) to the current mine plan, which instigated the update of this CHIA. The mine permit area is located mostly in Sections 8 and 17 and also extends into the SE1/4 of Section 7 and the NE1/4 of Section 18 of Township 13 South, Range 8 East, Salt Lake Baseline and Meridian. The revised permit area is identified by a dark blue color outline in **Figure 1**. Future mining is anticipated in the northern part of Lease UPU-74804.

Access to the minesite is obtained via County Road 290 (formerly State Highway 139) the Consumers/Clear Creek county road which runs northwest off U.S. Highway 6 between Spring Glen and Carbonville Utah. County Road 290 currently is paved for approximately four miles where it turns into a graded gravel road for the remainder of it's length. The Consumer/Clear Creek Road passes through the Horizon mine permit area. This road is approximately 11.5 miles from the Junction of Highway 6 and County Road 290.

Gordon Creek #2, #7 and #8 Mines (Mountain Coal Company)

Swisher Coal Company originally opened the Swisher #1, on the south slope, and #2 mine, on the north slope, in Bryner Canyon. The entries to the mines sit above the current access road and were reclaimed. Swisher sold the mines to General Exploration circa 1960. Beaver Creek Coal Company, a subsidiary of Atlantic Richfield Company, purchased the mine from General Energy in 1969.



Location Map

- Wasatch Coal Field
- Coal Permit Areas
- Horizon CIA Area
- County Boundary
- CIA Areas
- Hydrologic Unit Boundary

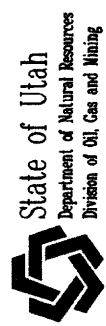


Figure 2
Cumulative Hydrologic Impact Assessment
Horizon Mine

LOCATION MAP

File: horizlocation.gra

Compiled by: Dan Smith Date: February 27, 2001

They developed two of portals up canyon in 1969 and named the mine the Gordon Creek #2 Mine. The mine connects with the Swisher #2 mine. It remained in continuous production until October 1985. Beaver Creek Coal Company later developed the #7 and #8. The permit area encompasses approximately 2,300 acres. There are two federal lease tracts that were established by the Bureau of Land Management: U-8319 and U-53159. Mines up canyon from the #2 Mine. The three mines were operating through the 1980's. The #7 Mine was opened in 1984 and was mined out and sealed in 1989. The #8 Mine was opened in November 1989 and mined out and sealed in November 1990.

The mine was closed in November 1990. The mine was later purchased by Mountain Coal a subsidiary of ARCH Minerals who initiated the mine closure and portal sealing and equipment and building were removed in 1991. Backfilling and regrading began in 1995. The application has applied for Phase I bond release but it was denied.

Gordon Creek #3 and #6 Mines (Mountain Coal Company)

The Gordon Creek #3 and #6 Mines are located in Coal Canyon. Room and Pillar mining began at the Gordon Creek #3 mine, in 1975 and the #6 Mine opened in 1978. Both mines share the same surface facilities. Coal was mined by room and pillar method and continuous miner. Both mines closed in September 1983.

Preliminary reclamation began in 1983. The portals were sealed and backfilled. Structures were remove shortly after sealing. The surface regrading and contouring took place in 1985 and 1986. The mine went through 10 years of vegetation growth and stabilization before final bond release in 1998. The applicant showed through water monitoring that surface waters in the receiving streams was not being impacted from minesite runoff. At the request the sedimentation ponds were left on site, in the ephemeral/intermittent stream channel to collect storm showers for cattle and wildlife use.

III. HYDROLOGIC SYSTEM

The CIA is characterized by steep canyons and forested mountainous plateaus. Streams and springs tend to be perennial in the forested uplands and trend to ephemeral in the lowered semi-arid desert floors. Vegetation varies from Grassland-Sagebrush and Desert Shrub communities at lower elevations to Spruce/Fir/Aspen and Mountain Meadow communities at higher elevations. Areas north of the CIA are characterized by steep canyon lands with mixed pinon-juniper and sagebrush. These communities are generally used for wildlife habitat and livestock grazing. Alluvial fans covered with desert scrub line the Price River from its confluence with Willow Creek to Helper.

Underground mining activities can influence the surface and underground. The underground workings extend several miles. The mine's surface areas are usually smaller in comparison, but exposed to the elements. Several of the old mine workings were abandon without being reclaimed. They left unsightly coal refuse piles along the canyons. The black refuse absorbed solar energy and radiated heat which hindered plant growth. The loose coal waste eroded easily due to low cohesion and inadequate stabilization from root growth. A lot of the coal refuse washed down through the creeks. Still more refuse is perched along the streambanks.

with resistant sandstone units. Erosion produces moderate to steep weathered slopes interspersed with vertically exposed resistant ledges and cliffs. The regions characteristic high topographic relief incised by steep-walled canyons is the result of extensive erosion along zones of weakness. Surface elevations vary from 5500 feet to 9000 feet within the CIA, with the thick sandstones of the Blackhawk and Castlegate Formations forming most of this relief.

Stratigraphy and General Lithology

The stratigraphy, **Figure 3**, includes, the Upper Mancos, and the Starpoint Sandstone, the Blackhawk Formation, the Castlegate Sandstone, Price River Formation and Quaternary Alluvium.

Lithology of the Book Cliffs and Wasatch Plateau Coal Fields consists of a thick accumulation of Upper Cretaceous and Tertiary strata (**Table 2**). The Upper Cretaceous sediments of the section were deposited along the western margins of a north-south oriented interior seaway. A rapidly rising mountain belt to the west supplied clastic material for shoreline construction in wave-dominated delta systems. Throughout Cretaceous time, this seaway underwent a series of onlap (transgressive or advancing) and offlap (regressive or retreating) phases that deposited a number of broad delta and prodelta sheet sandstones. These sandstone tongues thicken westward and grade into back barrier, coastal and delta plain, and continental deposits. Seaward there is thinning and fining of sediment sizes.

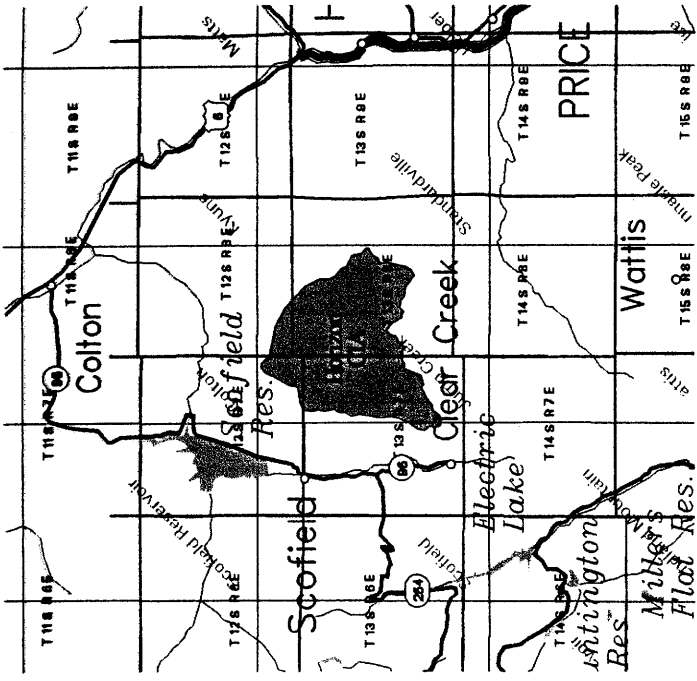
Major coal deposits found in Utah are usually formed immediately landward of shoreline delta sandstone pinchouts and on top of these offlap delta deposits.

Landward of the often thick shoreline coal accumulations, delta plain depositional influences such as splays, small channels, and levee deposits have generally created a series of splits in the coal section. Additional transgressive-regressive events commonly invaded the swamp systems and left interdeltic features such as storm washover fans, tidal inlet deltas, and lagoonal muds. Coal deposited in these environments are often thinner due to decreased time available for peat deposition. Coals that formed on delta sandstone sheets are usually very planar and continuous whereas coal seams found in the delta or lower coastal plain are much more likely to exhibit rolls or undulations, scouring by fluvial channels, and discontinuous or lenticular geometry.

In ascending order the strata exposed in the area are the Masuk Shale member of the Mancos Shale, the coal-bearing Blackhawk Formation, the unconformably overlying Castlegate Sandstone, the Price River Formation, and the North Horn Formation.

Mancos Shale

The Mancos Shale is exposed in the lower canyons over the CIA. It consists of medium gray to bluish gray shales and siltstones interbedded with sandstones and minor amounts of limestone. The Mancos Shale, which forms the valley floor and lower slopes of the prominent cliffs, is over 4,000 feet thick in the area and consists primarily of interbedded marine shales. The Masuk Shale, the uppermost member of the Mancos, grades upward into the basal sandstones of the Blackhawk Formation, and westward thinning wedges of Mancos Shale intertongue with the sandstones. The Mancos is a clay-rich unit and the shale beds are good aquicludes, with low horizontal and vertical permeabilities even near faults.



Location Map

- | | | |
|-------------------------|----------------------|--------|
| Recent Alluvium | Parlier Sandstone | Spring |
| Trail Mtn | Cascade Sandstone | |
| Aberdeen Sandstone | Unknown | |
| Spring Canyon Sandstone | CIA Area | |
| Older Alluvium | Perennial Stream | |
| Mudstone | Intermittent Stream | |
| Price River Formation | Main Road | |
| Shale Members | Graded Dirt Road | |
| North Horn Formation | Coal Outcrop | |
| Sonor Sandstone | Major Fault | |
| | Major Inferred Fault | |

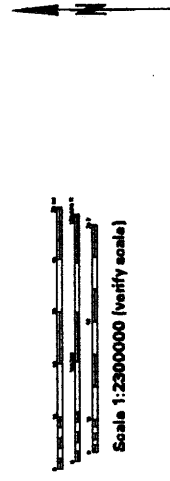
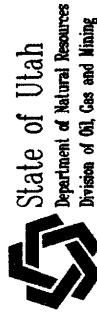


Figure 3
Cumulative Hydrologic Impact Assessment
Horizon Mine

GEOLOGIC MAP

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Compiled by: Dan Smith Date: February 27, 2001

Star Point Formation

The Star Point Sandstone is the basal unit of the Mesa Verde Group is about 440 feet thick in the CIA. The Star Point consists of interbedded cyclic layers of sandstones and Mancos Shale. The three massive sandstone beds are identified as the Panther Canyon Member, Storrs Sandstone and Spring Canyon Member. The Spring Canyon Tongue lies immediately below the Hiawatha Coal Seam.

Blackhawk Formation

The base of the Blackhawk Formation is locally comprised of five cliff-forming sandstone members, the Panther, Storrs, Spring Canyon, Aberdeen, and Kenilworth Sandstones, in ascending order. The basal Blackhawk sandstones were deposited in a barrier-beach environment and intertongue with the Mancos Shale below. The sandstone tongues thicken westward and grade into the back-barrier, coastal plain, and deltaic deposits of the Blackhawk Formation. The Panther, Storrs, and Spring Canyon sandstones merge to the west into one massive sandstone unit, up to 1000 feet thick, called the Star Point Sandstone. Lithologies are usually comprised of gradational sorted sandstones; medium-grained and cross-bedded at the top and fine-grained to silty at their base. These sandstones are generally poor aquifers, due in part to low permeability shale lenses, but ground water transmission is greatly enhanced where these rocks are faulted, fractured, and jointed.

Table 2 - Generalized Stratigraphic Section

System	Series	Stratigraphic Unit		Thickness (feet)	Description	
TERTIARY	Paleocene	Wasatch Group	Flagstaff Limestone	200 - 1,500	Dark yellow-gray to cream colored, dense, cherty, lacustrine limestone with thin interbeds of gray and gray-green shale. Minor amounts of sandstone and volcanic ash, with pink calcareous siltstone at the base in places. Ledge former. Many springs originating from this unit have large discharge rates shortly after snowmelt with rapid decrease, indicating large transmissivity and small storage capacity characteristic of solution-cavity ground water systems.	
			North Horn Formation (Lower Wasatch)	500 - 2,500	Variegated shale and mudstone interbedded with sandstone, conglomerate, and limestone, all of fluvial and lacustrine origin. Ledge former. Many springs originate where low permeability layers intersect the land surface, indicating perched ground water systems.	
CRETACEOUS	Danian?	Mesaverde Group	Price River Formation	500 - 1,000	White to gray, gritty, calcareous to argillaceous sandstone interbedded with subordinate carbonaceous shale and conglomerate. Ledge and slope former.	
	Maestrichtian		Castlegate Sandstone Member	100 - 500	Coarse grained fluvial sandstone, pebble conglomerates, and subordinate zones of mudstone. Cliff former. High permeability but largely unsaturated. Seeps and springs with seasonal variability are common.	
			Campanian	Blackhawk Formation	900 - 1,400	Fine to medium grained, thin to thick bedded, massive fluvial channel sandstone, alternating with subordinate siltstones, carbonaceous shales and mudstones, and coal. Fluvial channel sandstones are more common in the upper portion. Thick, discontinuous coal seams in the lower 500 feet. Slope former with sandstone ledges. Poor aquifer material even where faulted due to the discontinuous nature of the channel sands and the swelling properties of the shales. Relatively low transmissivities. Springs have seasonal variability. In-mine flows of up to 200 gpm with rapidly decreasing discharges. The lower Blackhawk and Starpoint are considered to be one aquifer.
				Kenilworth, Aberdeen, *Spring Cyn., *Storrs, and *Panther Sandstones (*Star Point)	90 - 1,000	Fine to medium grained, massive, moderately well sorted coarsening upward sandstones. Cliff forming. Subordinate siltstones and carbonaceous shale. Intertongues with the Mancos Shale below and the Blackhawk Formation above. Uppermost portion contains fluvial channel sandstones. Generally poor aquifer material yielding < 10 gpm. Springs have low seasonal variation, indicating large aquifer storage coefficient. Transmissivities are relatively large where rock is fractured and faulted with yields up to 300 gpm.
				Santonian	Mancos Shale	Masuk Shale

After Doelling, 1972

The aggregate thickness for the Blackhawk Formation in the area is roughly 900 to 1,400 feet thick. The Blackhawk Formation is the primary coal-bearing formation in the Book Cliffs and Wasatch Plateau Coal Fields. The important coal seams occur in the lower 500 feet. Thick and laterally extensive seams are closely associated with shoreline barrier-beach sands. Resting on and landward of the barrier-beach

sandstones are lenticular sediments including reworked tidal channel-fill sandstones, fluvial sandstones, mudstones, siltstones, claystones, and coals deposited in back-barrier, lower coastal plain, and deltaic environments. Claystones contain high percentages of montmorillonite and other swelling clays.

There are two coal seams of economic interest at present, **Figures 4 and 5**. These seams are the Castlegate A Seam, **Figure 4**, which lies above the Aberdeen Sandstone Member of the Blackhawk Formation and the Hiawatha Seam (Wattis, after Tabot 1999), **Figure 5**, sits directly on the Starpoint Sandstone. Recent, geologic evaluation of the coal seams by personnel of the Utah Geological Survey presents an updated nomenclature of the coal seams in the northern Wasatch Plateau.

David Tabet et al, 1999 present a revised stratigraphic sequence to the commonly identified Hiawatha Coal Seam. They report that it has been common practice to name the basal coal seam lying above the Star Point Sandstone the Hiawatha coal seam. Their study shows that the commonly identified Hiawatha seam correlates with the Axel Anderson seam in some places and the Cottonwood seam in other places.

Fluvial channel sandstones are found in the lower Blackhawk but are more frequent toward the top of the formation. These sandstones are local in extent, generally fine grained, and well cemented. They have localized high clay content. The discontinuous character of these channel sandstones and the abundance of clay throughout the Blackhawk Formation produce perched aquifers and favor formation of local flow systems that discharge through numerous seeps and springs.

Castlegate Formation

Unconformably overlying the Blackhawk Formation are the massive cliff-forming sandstones of the Castlegate Sandstone. This formation is characterized by fluvial sands probably deposited in a braided stream environment that progressed seaward over the deltaic and coastal plains (Van de Graff, 1982). The Castlegate Sandstone is good aquifer material, with seeps and springs common at the Castlegate-Blackhawk contact. In the Price River area the Castlegate Sandstone can be subdivided into three generic members with an aggregate thickness of about 630 feet. The Castlegate Sandstone is the remnant of coastal and fluvial deposition during a rapid retreat of the Upper Cretaceous Seaway in the area. The Castlegate Sandstone is exposed along the ridge in the northern part of the CIA. Tertiary rocks of the Wasatch Group form the uppermost exposures in areas south of the CIA.

Price River Formation

The Price River Formation overlays the Castlegate Sandstone. This formation consists of fluvial pebble conglomerates and coarse grained sandstones. The remainder of the Price River Formation is comprised of fine-grained sandstones and slope-forming mudstones and siltstones totaling approximately 650 feet in thickness.

Deposition of the upper Price River Formation took place from southwest to northeast indicating major reorientation of area drainage patterns between the periods represented by the Castlegate Sandstone and the Price River Formation, and the contact appears unconformable at some locations.

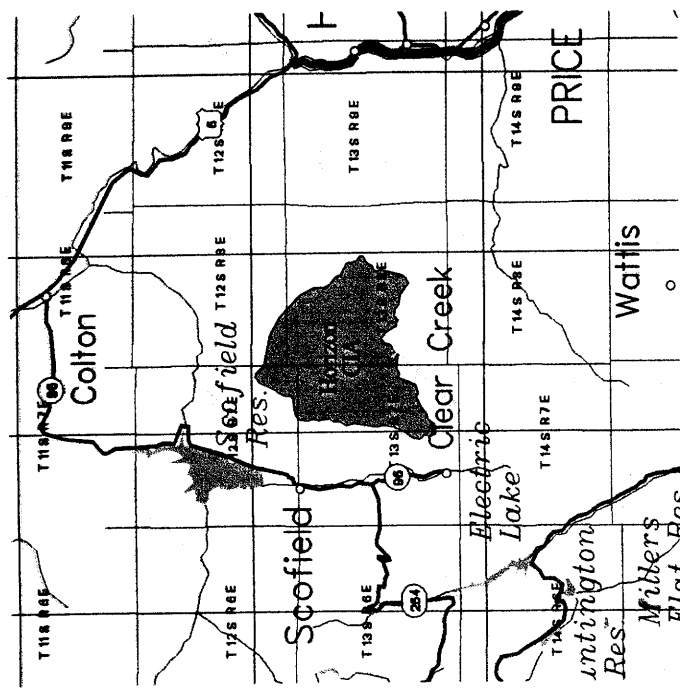
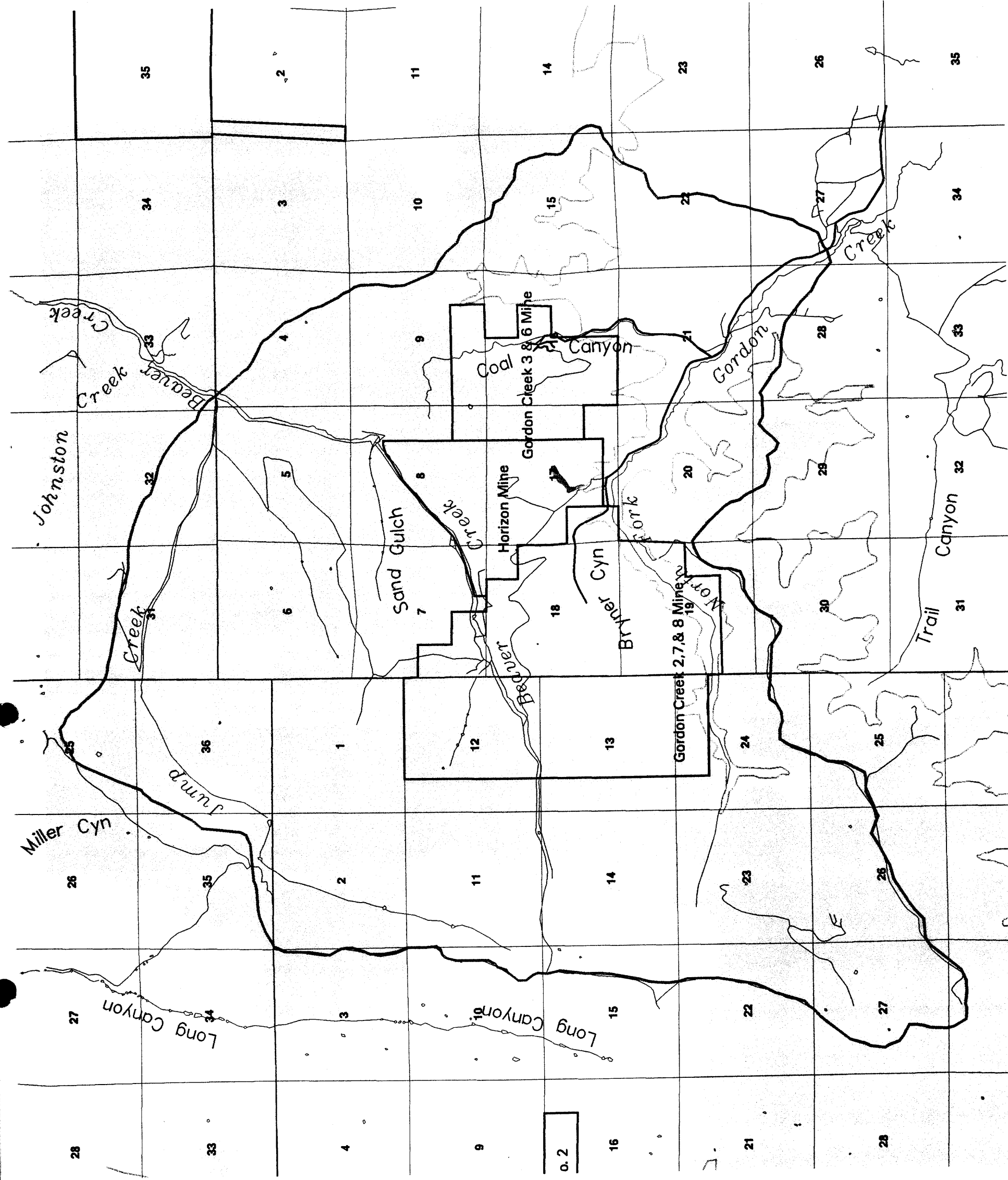


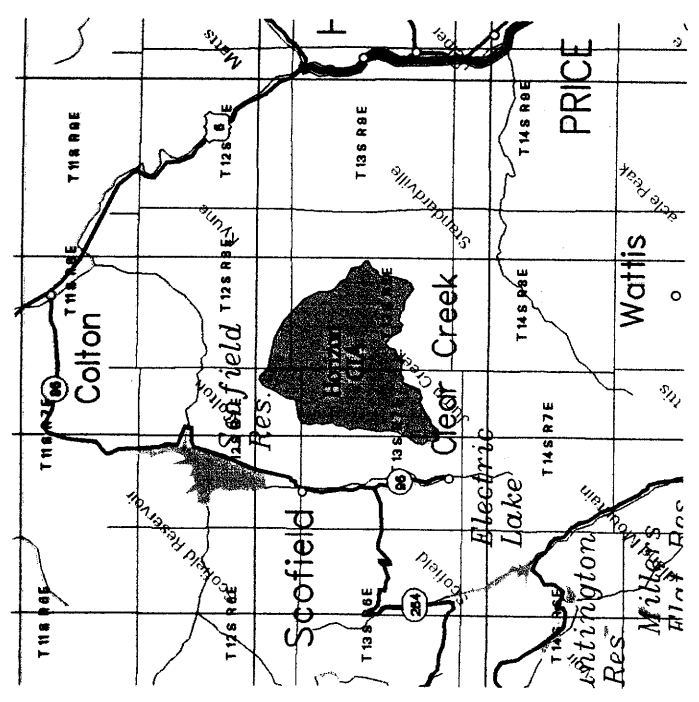
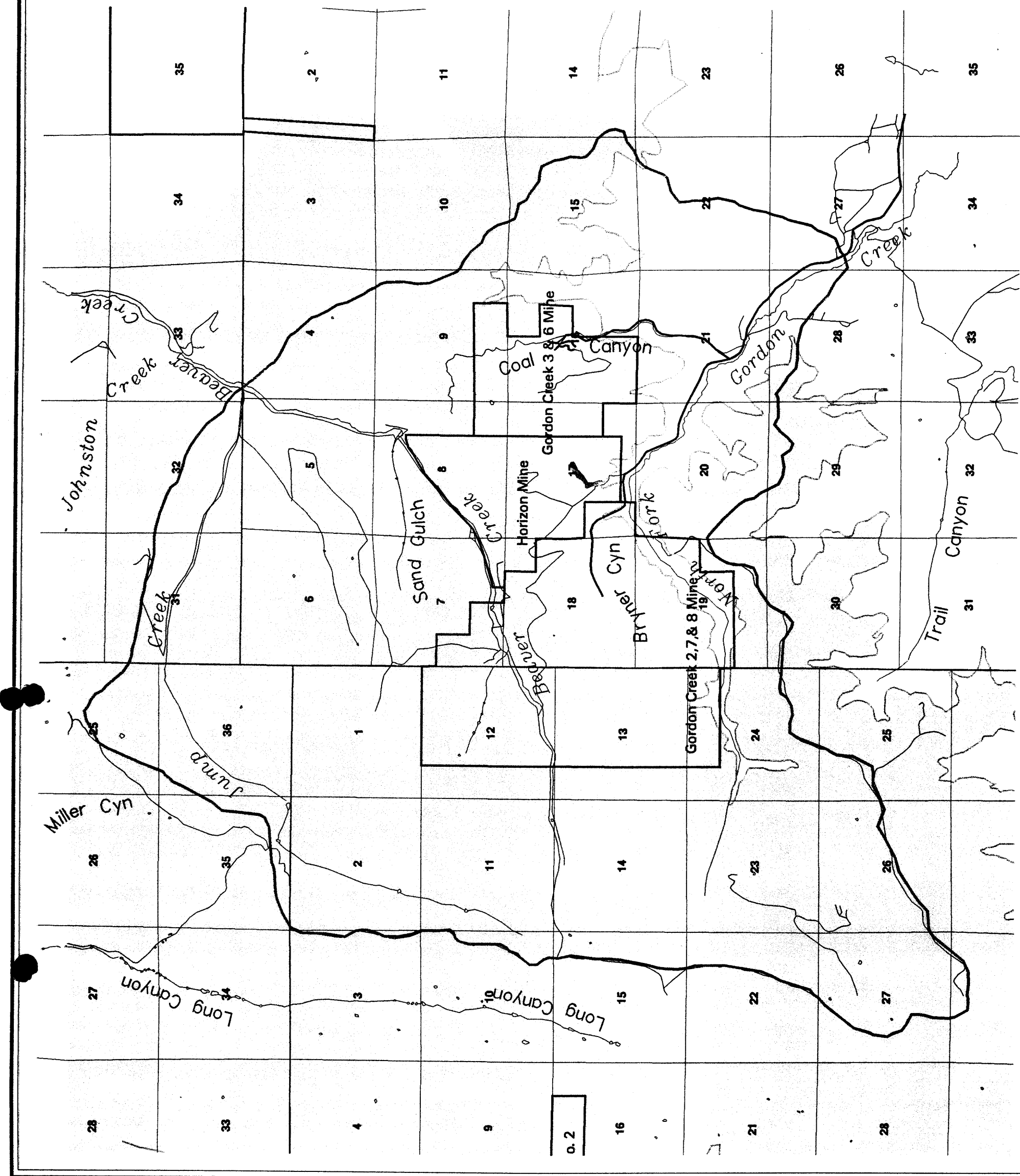
Figure 4
Cumulative Hydrologic Impact Assessment
Horizon Mine

MINE MAP

Castlegate A Seam

File: minemapcastle.gra

Compiled by: Dan Smith
Date: February 27, 2001



Location Map

- Wattis/Haiwatha Seam
- Mined Area
- Disturbed Area
- CIA Area
- Perennial Stream
- Main Road
- Graded Dirt Road
- Coal Outcrop

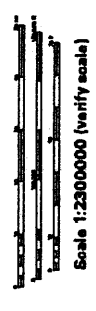
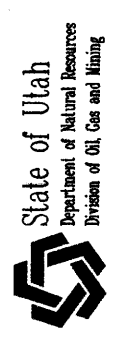


Figure 5 Cumulative Hydrologic Impact Assessment Horizon Mine
MINE MAP Haiwatha Seam(Wattis)
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Compiled by: Dan Smith Date: February 27, 2001

North Horn Formation

The North Horn Formation, the youngest consolidated rocks exposed within the CIA, has a total thickness of about 2,400 feet. This unit mainly consists of basal mudstones (170 feet), a middle zone of sandstones (860 feet), mixed thin limestones and claystones (330 feet), and an upper 1,000 foot sequence of sandstones and limey sediments. Lenticular, cliff-forming (10 feet) sandstones comprise about 10 to 15% of the section. The basal 170 feet of the formation represents the uppermost of the Mesozoic strata in the area. Tertiary (Paleocene) fluvial and lake deposits appear from the top of the basal mudstones to the top of the section.

Structure

Faults

Generally, the CIA lies within the transition between the Book Cliffs and the highly fractured strata of the Wasatch Plateau. The area is generally broken into two major folds and two systems of high angle normal faults that are NS and WNW-ESE trending. The northern part of the CIA dips gently NW-NE associated with the Beaver Creek Syncline. To the south rocks dip east and west off the Gordon Creek anticline.

The CIA contains three major fault zones: the Pleasant Valley, North Gordon and Fish Creek Fault zones. The Gordon Creek fault zone, trends north-south, and the Fish Creek fault zone trends north 60 degrees west. The faulting appears to have influenced the development of Gordon Creek and the locations of springs and seeps in the permit area. Faulting and fracturing provide conduits for surface water to enter the groundwater and allows movement between aquifers. The other major structural feature potentially controlling groundwater occurrence is the Beaver Creek Syncline trending NE-SW with dip at approximately 3.5 degrees.

The Fish Creek Fault Zone forms a graben that trends northwest/south east. The Coal Canyon Fault has a displacement of approximately 600 feet and forms the eastern boundary for the Gordon Creek No. 3 and 6 mines. Similarly, an unnamed fault with 120 feet displacement forms the southwest boundary for the Gordon Creek No. 2 mine. Numerous smaller faults with displacement of approximately 3 to 40 feet were encountered in the Gordon Creek Mines. Mine maps from the Gordon Creek Mining and Reclamation Plan show northwest trending and north-south trending faults were encountered in the mines.

IV Hydrologic Resources in the Ground Water Cumulative Impact Area

Aquifer Characteristics

A principal factor influencing the distribution and availability of ground water is geology. Lithology and structure will affect the presence of groundwater, the location and rate of its discharge. Aquifers producing a significant number of springs in the CIA include the Castle Gate the upper zone of the Blackhawk. The Price River formation, Price River/Castlegate and Castlegate/Blackhawk contacts, and the Star Point formation also yield spring discharge at a lower frequency. Regionally the Blackhawk/Star Point aquifer has been considered an important aquifer.

The Star Point Sandstone consists of the Panther, Storrs and Spring Canyon Sandstone members from the stratigraphically lowest to stratigraphically highest member respectively. The Spring Canyon Member

is composed of fluvial shales siltstone and channel sandstones (Section 6.5.2.1). The Star Point is approximately 900 feet thick in the Gordon Creek area. Recharge to the Star Point occurs primarily from vertical movement through the Blackhawk. The vertical permeability from fractures in the area is relatively significant.

The Hiawatha Coal Seam in the Blackhawk Formation directly overlies the Star Point Sandstone. Information from the proposed mining indicates this seam will produce water during mining. Removing coal from this zone may reduce the potentiometric surface of the Star Point.

The floor of the Castle Gate "A" seam is carbonaceous silty shale to fine grained fluvial sandstone. The roof consists of carbonaceous silty shales over 80 % of the permit area and the remaining 20% consists of fluvial channel sandstones that initially produce water then tend to dry up. The general channel trend is NE-SW and the channels tend to increase in frequency to the West.

The Aberdeen Sandstone overlies the Castle Gate "A" Coal Seam. Drill logs indicate this sandstone member is discontinuous over the CIA. The sandstone is interbedded with siltstones and shales. This sandstone is not anticipated to be a significant aquifer because it has a thin interbedded lithology and only one springs in the CIA may issue from this formation. According to information provided in the Gordon Creek 2/7/8 mine plan, the Aberdeen Sandstone is under artesian pressure near the Junction of Jump Creek and Beaver Creek. This is on the north side of the fracture bounding the region proposed for mining.

Other members containing aquifers above the coal seams include the Castlegate Sandstone, the Price River Formation and unconsolidated alluvial sediment deposits. The Castlegate Sandstone is exposed in the central and northeastern section of proposed mining and is approximately 300 feet thick in the Gordon Creek area. The Price River formation overlies the Castlegate Sandstone and occurs in the north eastern portion of the permit area.

Alluvial/Colluvial Aquifer System

The alluvial/colluvial aquifer system consists of shallow, unconfined ground water in the limited alluvial/colluvial deposits associated with surface drainage in the area. These aquifers are closely tied to the surface water systems, with ground water recharge occurring during periods of high flow and ground water discharge becoming more pronounced during periods of low flow as stream levels drop below the water table. The regional aquifer system may also be a source of recharge to alluvial/colluvial systems. Unconsolidated deposits occur along valley floors and at the base of steep slopes. Some of these deposits are recharged from the Blackhawk and Star Point aquifers. The thickest alluvial deposits in the permit area occur along Beaver Creek.

Water in Mines

The Gordon Creek No.6 mine was developed into the Castle Gate "A" seam and the only water encountered is reported to have issued from channel sands exposed in the roof. The rate of discharge was described as dripping with no measurable inflow. Some of the formations may tend to appear dry because they lose water to fracture systems. Much of the Gordon Creek No. 3 mine was extensively developed in the Hiawatha Coal Seam and was essentially dry until a 12 foot graben was encountered which initially produced 400 gallons per minute.

During retreat mining of the graben the faulted zone was dry. Additional water occurred along intrusive dikes where the coal was coked creating a more permeable zone of water. Water was produced from the roof floor and face but, dried up behind the mine. The Hiawatha Coal Seam was developed prior to mining the Gordon Creek No.3 mine (1984, CIA). This early mining may have dewatered overlying aquifers, if present, providing a relatively dry mining condition for Gordon Creek. As mining moved across the graben to the west substantial amounts of water were encountered. Estimates place the flow from 200 to 600 gpm. The area where significant increases of water were encountered is north of the fault bounding the area proposed for future mining.

Currently a large volume of water seeps from the hillside at the junction of Coal Canyon and the North Fork of Gordon Creek. This may be associated with a fault system. It is not known if there is a connection between the Gordon Creek #3 and #6 Mines and the spring. A vegetation change has occurred in an area below the Gordon Creek No. 3 mine within the past 10 years. The area at the mouth of the canyon, on the northwest side, has been saturated with water which has killed a large stand of aspen trees. Some speculation suggests that water draining from the reclaimed mine now saturates the area and that is why the trees have died. It is undetermined why the trees have died.

The Gordon Creek #2 mine has mined beneath Beaver Creek. There was generally a greater amount of groundwater inflow to the mine where there was less than 100 feet of overburden. A significant groundwater inflow took place when mining occurred under Beaver Creek at a point where the operations encountered a fault. The overburden was 500 feet. Water occurred at a rate of 20 to 40 gallons per minute and was considered to be associated with the down-dropped side of the fault. Overall, groundwater intercepted has not met in-mine water supply needs and water was pumped into the mine from Sweet Canyon.

A 100 foot fault lies adjacent to Gordon Creek #2 mine portal. On the opposite side of the fault is a spring with less than 1 gallon per minute flow. According to the Gordon Creek #3 and #6 permit mining up to the fault did not produce significant amounts of water from the fault.

No information on in mine groundwater was available for the abandoned Sweets Mine. Surface drainage from the North Fork of Bryners was observed to be impounded behind the Gordon Creek No. 2 mine yard, without an obvious discharge. It is considered possible that this water seeps into the Old Sweets Mine via subsidence tension cracks. A spring located along the fault zone in Sweets Canyon also intersects in the region of the suspected subsidence tension cracks. The fault zone is hypothesized to be the hydraulic connection between inflow to Sweets Mine and the discharge to Sweets Canyon.

Locally, potential water bearing members above the Hiawatha coal seam includes the Blackhawk and the Blackhawk-Star Point aquifer. Both the Blackhawk and Star Point Formations serve as sources of spring and seep flows. According to Price and Arnow (1974), the upper cretaceous sediments of the area have low hydraulic conductivities and specific yields of 0.2 to 0.7%. Two pump tests from wells drilled in the Blackhawk formation in Eccles Canyon indicate transmissivities of 21 and 16.3 gallons per day per foot. The Blackhawk aquifers are generally laterally discontinuous perched aquifers and fluvial channel sandstones.

The Horizon mine has developed wells in the Star Point, Spring Canyon tongue. The hydraulic conductivity of the Spring Canyon formation was found to be 16.1 feet/day in the fractured portion of the

formation as found in HZ-95-1. The hydraulic conductivity of well HZ-95-2 was 0.25 feet/day and HZ-95-3 was 0.20.

Seeps and Springs

There are several springs in the vicinity of Beaver Creek and Jump Creek, **Figure 6**. The majority of the springs in the CIA are associated with the Blackhawk Formation. Several springs were identified as being related to faults Jewkes Creek contains two springs, a perennial spring at the head of the canyon (Consumers) is thought to be fault related and another small spring at the fork between Consumers Canyon and Bryner Canyon. The flow coming from the later spring is intermittent. Perennial and intermittent springs appear in the Beaver Creek/Jump Creek area. Springs occur where the recharge potential from alluvium and sandstone units in the Price River Formation and Castlegate Sandstone is high or from fractures created by faulting. Ephemeral springs tend to be linked to shallow aquifers consisting of soils, alluvium or colluvium.

Groundwater discharge from the Consumers Canyon produced 200 gallons per minute in September 1983, a high snowfall year. Information in the C&W Mining and reclamation plan indicated flows of 5 gallons per minute is a representative discharge from the springs (C&W, 1980). The Gunnison Homestead and Sweets Canyon spring are also fault related.

Information provided by the Horizon Coal Mine indicate that 42 springs issue from the Upper Blackhawk, 3 springs issue from the Star Point formation 67 springs issue from the Castlegate, 15 issue from the Price River formation, 8 issue from the contact between the Price River/Castlegate formation and 2 springs issue from the contact of the Castlegate/Blackhawk formations within the region of proposed mining..

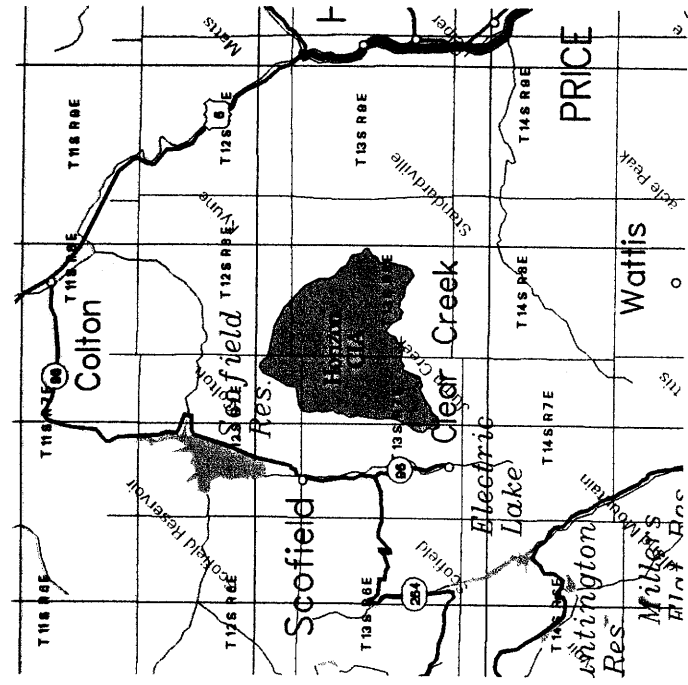
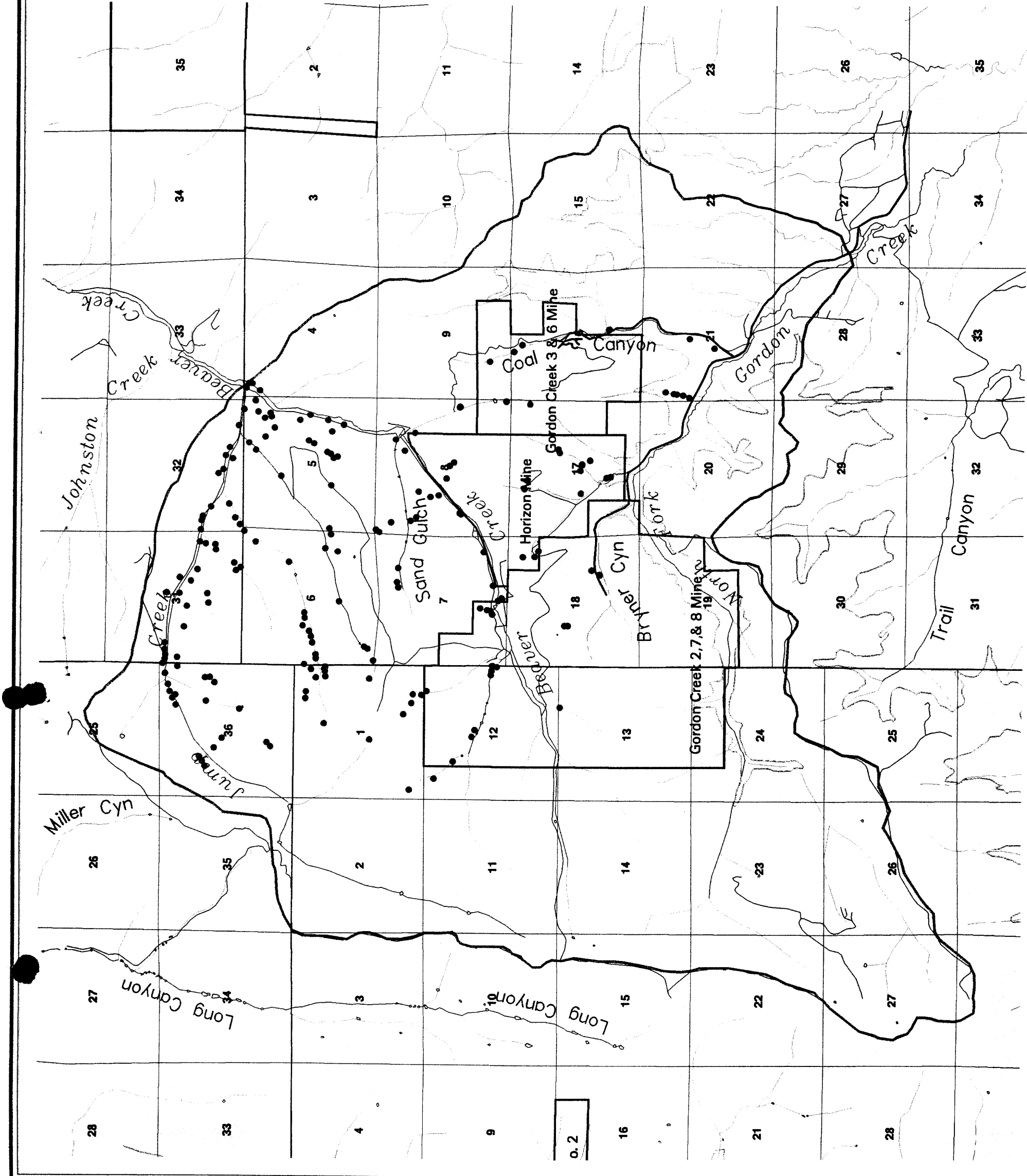
Information on water rights has been presented by the operators of the mines. Most springs in the Beaver Creek/Jump Creek area are used for stock watering. Seeps, springs will be monitored in accordance with the Ground Water Monitoring Plan in Chapter 7 of Horizons MRP.

Groundwater Quality

The groundwater quality of the upper Cretaceous Sediments in the Wasatch Plateau is characterized by total dissolved solids (TDS) contents of less than 1,000 milligrams per liter (mg/l). The following range of TDS measured in springs wells, and mines issuing from or completed in formations found in the permit and adjacent areas as reported for the Wasatch Plateau and Book Cliffs areas by Waddell et al.(1981):

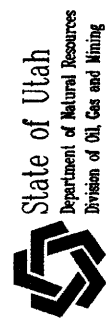
- | | |
|-------------------------|--------------|
| • Price River Formation | 122-792 mg/l |
| • Castlegate Formation | 315-806 mg/l |
| • Blackhawk Formation | 63-796 mg/l |
| • Star Point Sandstone | 355-391 mg/l |

Springs from the Blackhawk Formation are a calcium-bicarbonate type. Concentrations of TDS tend to vary inversely with flow and pH of the waters is generally somewhat alkaline. The following table contains some selected water quality data collected by mine operations and is included in the Horizon mining and reclamation plan. **Table 3** identifies field parameters of selected springs adjacent to the Horizon Mine.

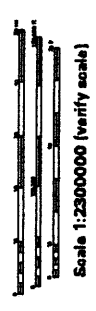


Location Map

- | | | | |
|--|---------------------|--|-------------|
| | Mined Area | | Spring |
| | Disturbed Area | | Well |
| | CIA Area | | Surface |
| | Perennial Stream | | Underground |
| | Intermittent Stream | | UPDES |
| | Main Road | | |
| | Graded Dirt Road | | |
| | Coal Outcrop | | |



State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining



Scale 1:2300000 (verify scale)

Figure 6
Cumulative Hydrologic Impact Assessment
Horizon Mine

HYDROLOGIC MAP

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Compiled by: Dan Smith Date: February 27, 2001

Table 3.
Selected Spring Sampling Summary
(Summary of information from portions of the Horizon Mine Plan)

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
SP-1 1989 to present	Station #1 1989 through 1993	Issues from Hillside and flows into Jewkes Creek (Blackhawk Sandstone unit above coal seams 8195 ft msl.)	TDS 230-330 mg/l pH 7.5 - 8.5	Late Spring 10-15 gpm High flow on 5/89 was 45 gpm Late Summer/Fall 5 to 6 gpm	
SP-2 1989 to present	Station #2 1989 through 1993 (This description matches the station number 1 previously; Channel in North Fork of Gordon Creek.)	Issues from Hillside and usually flows approximately 100 feet (Blackhawk, 8005 ft msl)	TDS 480-540 mg/l pH 7.5 - 8.52	Flow in Late Spring 1-2.5 gpm Flow in Late Summer/Fall <1 gpm Dry 7/1991, 8/1991, through 12/1992	Spring flows through alluvium below the point of origin.
SP-4 1989 to present	#4 1989 through 1993	Jewkes Creek Drainage flows along road empties into Jewkes Creek (Blackhawk, 8102 ft msl)	TDS 350-480 mg/l pH 7.5 - 9.71	Flow in Late Spring 1-2.25 gpm Flow in Late Summer/Fall <1 gpm	
SP-6 1989 to 1995	#6 1989 to 1995	Upstream from the proposed mine portal (Blackhawk)	N/A	dry from 1989 through 1995	This location is not a spring and will not be included in future monitoring
2-6-W	Gunnison Homestead Spring	Tributary to Beaver Creek near confluence of spring discharge channel and Beaver Creek (Blackhawk)	not discussed	3-136 gpm the 136 gpm included snowmelt runoff.	

Sampling Point	Monitoring History	Location (Formation)	Water Quality	Water Quantity	Comments
SP-9	Jewkes Spring USGS 1979-1983 Station 2-5-W Beaver Creek Coal Company 1985-1995	Near Beaver Creek Channel, south west corner of proposed LOM permit area. (Blackhawk, 8550 ft msl)	TDS 240-300 mg/l pH 7.5 - 8.5	Typical Late Spring flow 20 to 60 gpm decreasing late fall 1.10 to 38 gpm (Maximum flow on 7/85 was 1372 gpm considered spurious).	Location mapped on Figure 7-3, MRP Information on flow discussion in Section 7.2.2.2 varies from Section 7.1.2.2

Two water quality samples were collected in the Blue Blaze No. 1 Mine workings, in May 1992 and one in November 1995. The water was determined to be a calcium bicarbonate type with TDS ranging from 414 to 452 mg/l and pH from 6.8 to 7.66. Groundwater samples collected in-mine at the Horizon #1 Mine in 1995 and 1996 show pH ranging from 7.38 and rising to 8.36, with specific conductance ranging from 485 to 595 ohms.

Surface Water

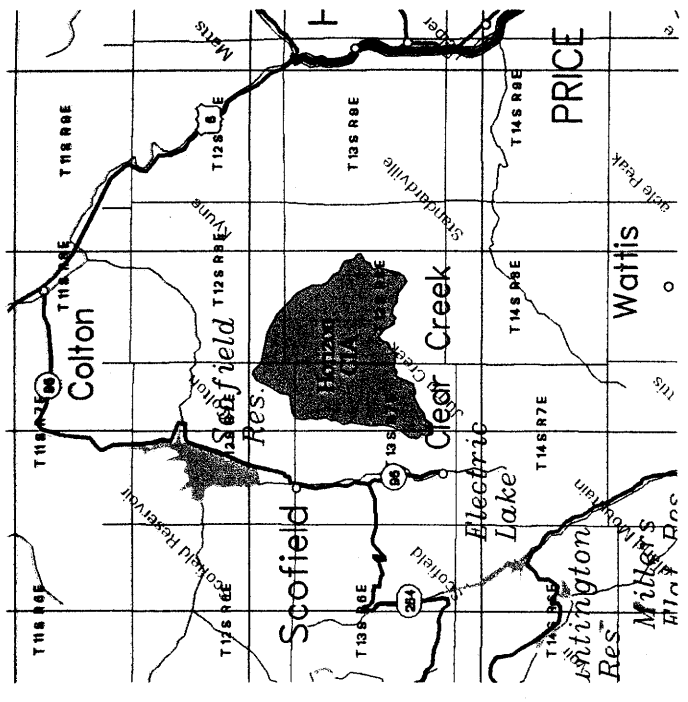
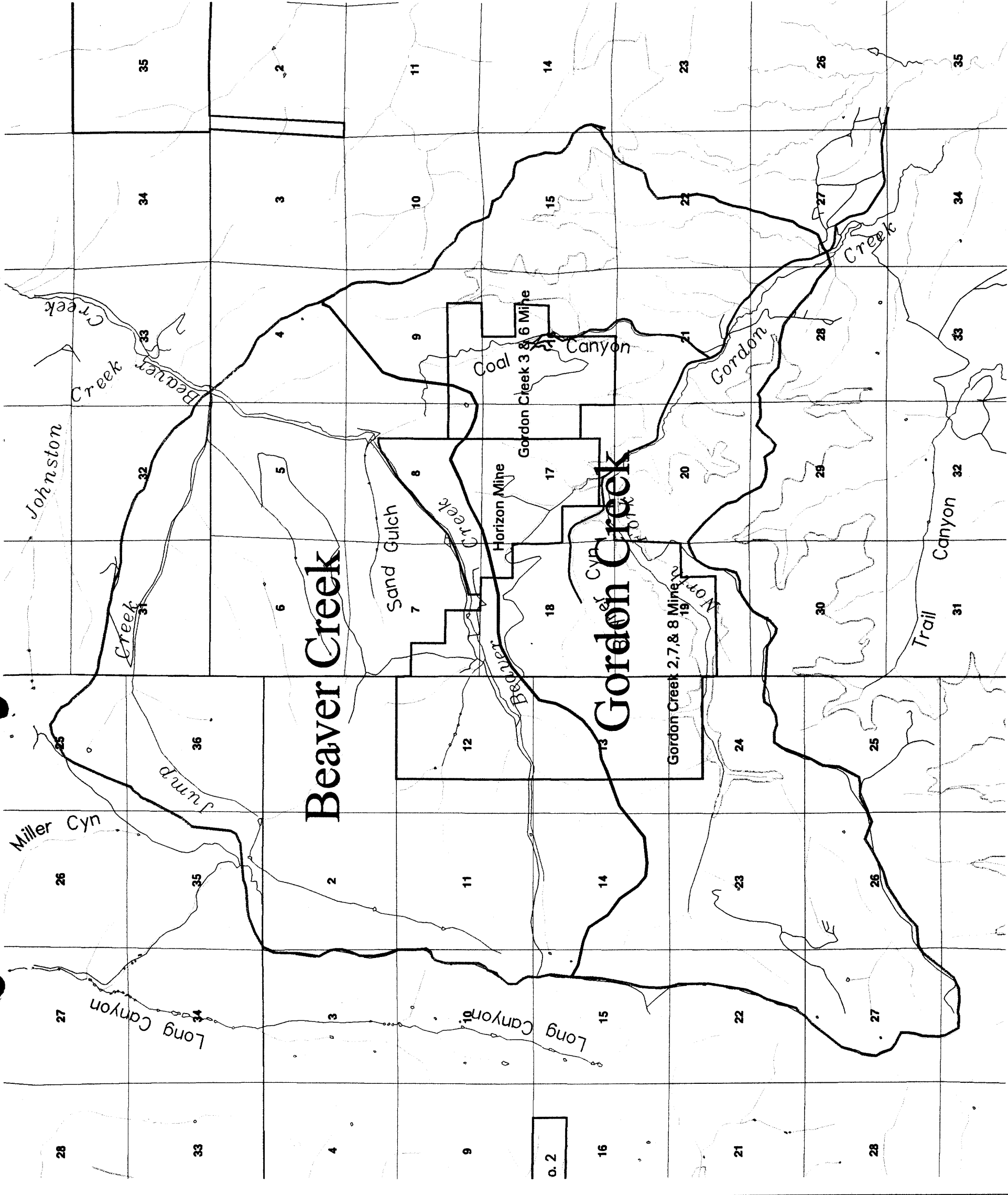
The CIA lies within the Price River Basin, **Figure 7**. The major drainage within the CIA are; the Beaver Creek Drainage and the Gordon Creek Drainage which drain into the Price River. The Price River is tributary to the Green and Colorado Rivers. Major drainages within the CIA are; Beaver Creek north of the mine site, and the North Fork of Gordon Creek and Gordon Creek south of the mine site. The disturbed area drains into the North Fork of Gordon Creek.

Beaver Creek has a drainage area of approximately 16,700 acres. Smaller drainage basins in the Beaver Creek Drainage include; Jump Creek; Sand Gulch; Johnston Creek; and unnamed perennial, intermittent and ephemeral drainage. Johnston Creek is at the downstream boundary of the CIA.

Beaver Creek is a perennial stream with base flow maintained by seeps and springs. Beaver ponds are common in Beaver Creek and also play a part in providing perennial flows. Springs contributing to base flow include the Gunnison Homestead Spring, within one mile west of the proposed additional lease area, and Jewkes Springs one mile west of the permit area near the north west corner. Discharges from these springs vary between 3 to 136 gpm and 1.1 to 38 gpm respectively.

The USGS maintains a gauging station (09312700) near the mouth of Beaver Creek several miles northeast of the permit area with a period of record from 1960 through 1989. The minimum annual discharge for this period was 338 acre feet in 1961. The maximum annual discharge of 1,610 occurred in 1973. The average annual discharge for the 29-year period of record was 3,310 acre feet. Decreases in downstream flow are observed in Beaver Creek between monitoring stations SS-7 and SS-8. The decrease is most prevalent during the low flow season. This losing stream section may occur due to either alluvium, fracture and fault systems or other unknown factors.

The main water source in the Gordon Creek drainage comes from the North Fork of Gordon Creek which is a perennial stream. The North Fork of Gordon Creek flows along County Road 290 southeast of



Location Map

- CIA Area
- Perennial Stream
- Intermittent Stream
- Main Road
- Graded Dirt Road
- Coal Outcrop
- Watershed Boundary

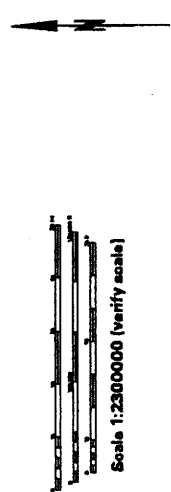
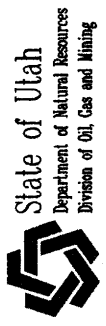


Figure 7
Cumulative Hydrologic Impact Assessment
Horizon Mine

WATERSHED BOUNDARY MAP

File: horizwatershd.gra

Compiled by: Dan Smith Date: February 27, 2001

the permit area. The total drainage is about 12,000 acres. Other principle drainage include Jewkes Creek a perennial stream, Bryner Canyon, Consumers Canyon, Sweets Canyon and Coal Creek.

The State Division of Water Quality classifies Gordon Creek as Class 3C and Class 4 waters. These classifications are designated as; non-game and aquatic life, and agricultural uses, respectively. Beaver Creek, located over the future proposed mine workings, is classified as 1C and 3A, designated as domestic and agricultural uses respectively. There are fisheries down stream of the proposed disturbed area in the North Fork Gordon Creek.

Surface Water Quantity

Streams within the CIA receive their maximum flows in late spring and early summer as a result of snowmelt runoff. Flows decrease significantly during the autumn and winter months. According to information presented in the 1989 CHIA 50% to 70% of the runoff occurs during May and July snowmelt. Summer thunder storms may cause localized occurrences of short duration high intensity runoff.

Beaver Creek has a drainage area of approximately 16,700 acres an average annual precipitation of 23 inches and an average annual streamflow of 2,860 Acre-feet (Waddell, et. al. 1986). Beaver Creek is a perennial stream with base flow maintained by seeps and springs. Beaver ponds use to be common in Beaver Creek and played a part in providing perennial flows. Most of them have been removed, which has left the stream channeled, resulting in less bank storage. Some springs, **Figure 6**, contributing to the base flow include the Gunnison Homestead Spring(spring 2-6-W), and Jewkes Spring(spring SP-9). Discharges from these springs vary between 3 to 136 g.p.m. Jewkes Spring was observed to have dry periods.

Decreases in downstream flow were observed in Beaver Creek between monitoring stations SS-7 and SS-8 monitored by Horizon Coal Mining Co. The decrease is most prevalent during the low flow season. This losing stream section may occur due to either alluvium, fracture and fault systems, previous mining activities or other unknown factors. According to the 1989 CHIA, flows monitored by the Beaver Creek Coal Company at stations 2-4-W and 2-3-W, show an average loss in flows from the upstream and downstream station. Flow ratios varied between 68% to 91% with an average of 80%. The mean flow for the upper station in 1988 was 176 gpm, and while the mean flow at the lower station was 221 gpm. A study of flows determining existing losing and gaining reaches was conducted in September of 1996 by Horizon.

The North Fork of Gordon Creek begins in Sweet's Canyon. It is perennial and receives its flow from springs which potentially intersects groundwater from the regional Starpoint aquifer. The total drainage is about 12,000 acres. There is no flow data available for the North Fork of Gordon Creek below all mine operations. However, Beaver Creek Coal Company had established a stream sampling station below the Gordon Creek 2, 7 and 8 Mines in the North Fork of Gordon Creek. Observations from monthly flows data obtained in 1988 ranged from 87 g.p.m. to 359 g.p.m. with a mean flow rate of 190 g.p.m.

Jewkes Creek flows down Consumers Canyon and drains a watershed slightly greater than 1 square mile. It discharges into the North Fork of Gordon Creek. Jewkes Creek is perennial due to flow from a developed spring (SP-1) on the left fork. Flow in Jewkes Creek has varied from about 200 g.p.m. to 5 g.p.m.. The flow data indicate that normally the creek flows all year at monitoring Station #5, but becomes intermittent at Station #3. The flow diminishes in a downstream direction a few miles below the

mine where it infiltrates into the alluvium and does not reappear immediately. Water may reappear where the Mancos shale outcrops. Diminished flows are caused by infiltration of the flow and a reduction of recharge flow.

Bryner Canyon's drainage basin is about one square mile. Bryner is an intermittent stream with flow usually occurring with rainstorms and spring runoff as a result of snowmelt periods. Flows up to 3.6 cfs have been measured. Intermittent springs and seeps were found in the drainage. The main spring discharges from below the Castle Gate "A" coal seam above the Gordon Creek # 2 mine pad. Flow was estimated to vary from 1 to 5 gallons per minute. Flows which have accumulated in the channel seldom continued beyond the Gordon Creek #2, #7 and #8 mines disturbed area. The general feeling is that this water has been infiltrating into old mine workings associated with the Swisher Mine.

According to the 1989 CIA the Coal Canyon drainage area is approximately 1,329 acres and is ephemeral in nature. One sample was obtained in Coal Canyon above the Gordon Creek #3 and #6 Mine during spring runoff and flowed at approximately 1.6 g.p.m.. However, a greater flow, observed in the channel since reclamation, has occurred during onsite inspections. Springs at the tributary of Coal Canyon contribute significant flow to the North Fork of Gordon Creek.

The Beaver Creek Drainage and Gordon Creek drainage have numerous springs which contribute to base flow of streams. All of the drainage and many of the springs provide a point of use for water rights. Water rights are shown to be used for stockwatering and irrigation.

Surface Water Quality

Regional studies by the USGS and others indicate that, the general chemical quality of surface water is relatively good in the headwaters of Gordon Creek. TDS are usually less than 500 mg/l and the water signature is a calcium-bicarbonate type. Near the confluence of Gordon Creek and the Price River the water signature changes to a magnesium-sodium-calcium-sulfate type water with dissolved solids content as high as 1100 mg/l (Mundorff, 1972). These changes in water quality are caused by water contact with Mancos shale and irrigation return flows.

According to the 1989 CHIA, Beaver Creek had a mean TDS at the upper Gordon Creek #2, #7 and #8 monitoring station 2-4-W of 247 mg/l. The lower station, 2-3-W, had a mean TDS of 259 mg/l while maximum values are generally less than 500 mg/l. The mean TDS based on 12 monthly field samples for 1988 was 464 mg/l. The mean TDS for the North Fork of Gordon Creek at station 2-2-W for 1988 was 344 mg/l and ranged from 284 to 395 mg/l. Data from early mining operations are not extensive. Since mining had already occurred in the CHIA prior to enactment of SMCRA, the pre-mining characteristics are not available.

Information provided by the Horizon mine indicates the TDS concentration of Beaver Creek varies from about 200 to 350 mg/l and is lower than Jewkes Creek, which typically ranges from 300 to 500 mg/l. The pH of Beaver Creek is typically 7.5 to 8.5 and Jewkes Creek generally varies from 8.0 to 8.6. Both Jewkes Creek and Beaver Creek are typically a calcium bicarbonate type water. Dissolved constituents tend to be inversely proportional to flow while total constituent concentrations tend to be directly proportional to flow. Additionally, the ranges of water quality observed over the baseline monitoring period for the Horizon Coal Company are presented below in **Table 4**.

TABLE 4
SURFACE WATER QUALITY
Data summary 1989 - 1996

Station	Period Sampled	Iron (Total - mg/l)	Manganese (Total. mg/l)	TDS (mg/l)	TSS (mg/l)	pH
		Range	Range	Range	Range	Range
3	1989- 1996	ND - 8.5	ND - 0.25	283 - 799	ND - 72	6.2 5- 9.5
5	1989- 1996	ND - 3.9	ND - 0.14	198 - 550	ND - 245	6.7 - 9.34
7	1989 1996	ND - 5.19	ND - 0.19	168 - 353	ND - 297	6.0 - 8.54
8	1991- 1996	ND - 1.3	ND - 0.46	192 - 357	ND - 44	6.6 - 8.69
10 ⁽¹⁾	1996	0.32	0.01	60	ND	8.12 -8.96
11 ⁽¹⁾	1996	0.85	0.03	108	21	7.66 - 8.63

(1) The current data base is limited for this site.

Sediment Yield

The potential for increased suspended solids and sediment loading to Gordon Creek is probably highest during the construction phase of operation and reclamation. The operator has committed to monitor for turbidity of the water upstream and downstream of the site during the construction phases. A criteria for Class 3C allows a turbidity increase of 15 (NTU).

Increases in sediment during the operational period have been minimized through the use of disturbed and undisturbed area drainage controls. Undisturbed drainage is diverted away from the disturbed areas of the mines, while disturbed drainage controls such as ditches, berms and culverts control and direct runoff and sediment to sedimentation ponds.

Runoff and sediment controls have been constructed at the Gordon Creek #3 and #6 Mines, Gordon Creek #2, #7 and #8 Mines and Horizon Mine. The ponds are still in place at the Gordon Creek Mines. The Horizon Mine's sedimentation pond is located in Consumers Canyon. The operator of the Horizon Mine have committed to store snow in sites that will directly drain to the sedimentation pond. During the reclamation period alternate sediment control measures and/or sedimentation pond will be used.

During the past four years logging activities have taken place in the Beaver Creek area on Stamatakis property. Logging and transport activities have disturbed substantial areas along the roads and riparian

areas of Beaver Creek, the North Fork of Gordon Creek and Jewkes Creek. Trees are removed from the property and transported out over the county road which connects to State road 139, the North Fork of Gordon Creek. There have been no Best Management Practices for sediment control conducted on this logging site. Sediment yield from the logging sites and roads have been substantial. During the summer of 1997 the team conducting a subsidence evaluation noticed areas logged down to the Beaver Creek without a protection barrier. Sediments from the logging sites and access road flowed directly into the creek. Trees and branches littered the side of the creek. The dirt road along Beaver Creek was ground to a fine powder, in some places as much as 1 foot deep. The point bars and bottom of Beaver was covered with silt.

Logging continued during the winter months. As roads became muddy, the logging company used graders and bulldozers to excavate the muddy layers which were pushed in mounds above the roads and creeks, where they could easily flush into the creeks (Beaver Creek, a tributary to the North Fork of Gordon Creek and Jewkes Creek). Sediment loading into the creeks will likely continue until logging is completed. Operational monitoring could show significant changes in water quality and aquatic wildlife levels as a result of the logging practices.

The total effects from logging have not been quantified, however sediment loading was very noticeable and would have likely effected the invertebrate population.

Spills

Horizon Coal indicates Diesel fuel, oils, greases and hydrocarbon products will be stored above ground and may be spilled in the mine and on the surface during mining operations. An above ground 5,000 gallon diesel fuel tank will be located between the coal stockpile and the truck turn. A shop maintenance area will be located next to the mine office area.

The operator proposes the berm surrounding the tank will be adequate to contain the total volume of the tank, in the event water needs to be drained from the berm. The operator indicates spills will be handled in accordance with the Spill Prevention Control and Countermeasure (SPCC) Plan.

- Visual inspection of all tanks, associated valves piping and containment areas.
- Notification to the Mine Manager and containment of the spill
- Reporting requirements for spills.
- Procedures for preventing spills during filling tanks.
- A copy will be maintained on file in the Mine Manager's Office and the Mine Engineer's office.

The operator's proposal uses accepted practices for their SPCC plan. The operator should include; clean up procedures for small scale spills, commit to retain absorbent materials on site and, should provide either a concrete containment structure with a drain or provide for disposal and sampling of the earth material below the fuel tanks and areas of hydrocarbon use.

The operator can provide additional reasonable operation measures to minimize hydrologic impacts on and off the permit area.

The Gordon Creek #2, #7 and #8 Mines and Horizon Mine have established a water monitoring plan to assess changes in water quality leaving the site.

Recharge

Recharge to springs and seeps in the CIA originates in the small drainage or basins in the immediate vicinity. The low hydraulic conductivity of the rocks further limits recharge, although fractures are locally important in recharge and ground water flow. Waddell (1986) showed that springs in the upper reaches of Beaver Creek, in the Castlegate Sandstone and some members of the Blackhawk Formation are very responsive to precipitation events. They usually have high, short hydrographs responding to rapid recharge. Springs that are associated with regional aquifers or faults often have longer less fluctuating hydrographs. Low precipitation and high evapotranspiration limit the amount of water available for recharge.

Recharge to the regional aquifer system can occur where permeable facies outcrop and are exposed to direct precipitation and near-surface infiltration. Recharge percolates from the surface downward until shale is encountered and then moves downdip following discontinuous, but more permeable sandstones. Water either continues to move downdip until it is discharged at the surface or resumes vertical flow where more permeable zones are encountered, and recharge eventually reaches the regional aquifer. Vertical ground water movement through the overlying sediments is minimal due to the low permeability of the overlying units and the presence of relatively impermeable shales. Steep slopes and relatively small outcrop exposure areas are two factors that limit recharge. Faults and fractures are important ground water conduits in the CHIA..

Recharge to the regional aquifer can occur where formations are exposed and come in direct contact with surface runoff or the alluvial systems, such as in sections of Beaver Creek.. Recharge to groundwater is limited by formation permeabilities.

Perched Ground Water System

Perched aquifers in the Wasatch Plateau and Book Cliffs typically occur in numerous small, localized lithologic units that have sufficient permeability to store and transmit ground water. They are found at shallow depths in the Flagstaff, North Horn, and Price River Formations and upper portions of the Blackhawk Formation. The Blackhawk Formation, contains small perched aquifers which are dominantly interbedded sequences of shale, siltstone, and fluvial channel sandstones. In some larger sandstone units of the Blackhawk Formation fine grained, cemented sandstones are typically the water-bearing units with lower permeability siltstones and relatively impermeable shales acting to confine ground water movement. The voids of these units are filled with water that slowly yields its flow. Burned-out coal zones also have good permeability and can be perched aquifers. Isolated perched water tables may occur deeper in the rock where more permeable zones are encountered, and recharge eventually reaches the regional aquifer.

Perched aquifers are of limited areal extent and thickness because of the discontinuous or lenticular shape of the sandstone bodies. Variations of permeability within the sandstone bodies further limit storage and movement of water, and perched aquifers can be breached and truncated by deeply eroded surface drainage. The discontinuous character of the sandstones and the abundance of clay throughout the formations favor formation of local flow systems that discharge through numerous small seeps and springs.

Discharge from perched aquifers is primarily from seeps and springs at outcrops of sandstone-shale interfaces. Discharge from the perched ground water system to the regional ground water system can also

occur due to fracture or fault related secondary permeability, such vertical movement is significant in the CIA because of the abundance of faulting and fracturing.

Perched aquifers are generally recharged within small areas in the immediate vicinity of the seeps and springs where they discharge. Recharge is almost exclusively by infiltration of direct precipitation and snowmelt, and discharge from these aquifers closely tracks precipitation rates. The combination of steep terrain and relatively low permeabilities probably limit infiltration to less than 5 percent of annual precipitation (Price and Arnow, 1979),

Regional Aquifer System

A regional aquifer system exists in the coal bearing zones and the barrier-beach sandstones of the lower Blackhawk Formation and extends throughout the Blackhawk Formation to the underlying sandstone units of the Mancos Formation. Because it includes the primary coal-bearing sequence, the regional aquifer system can be directly affected by the mining operations.

The regional aquifer extends to the outcrop of Mancos Shale along Gordon Creek. Water is unable to flow downward through the Mancos in any significant amount but will flow laterally through more permeable overlying strata until it discharges at the surface. The regional aquifer discharges at springs along the Blackhawk - Mancos contact in Coal Canyon and Bryner Canyon. Leakage to the Mancos and other units underlying the regional aquifer should be minimal.

Stored Mine Water System

Coal mining during the past 70 years has resulted in extensive underground mine workings in the CIA. The mine workings follow the attitude of the coal and stratigraphy. As the mine moves deeper into the mountain it can extend into the local ground water table. This appears to be the situation with the current Horizon Mine. A mine can also come in contact with new facies where water is stored or fractures are connected with the perched ground water system. As with the Gordon Creek #3 Mine, the fault produced substantial amounts of water until it was drained.

Abandoned mine workings that extend beneath the regional water table serve as sinks in the regional aquifer system. However, seepage into the mines is extremely slow. In the western coal reserves area, mine inflows appear to be greatest where extensive retreat mining has produced substantial subsidence.

The total volume of ground water storage in the old mine workings in the eastern coal reserves is unknown, although it is probably substantial. There are few known instances of mine water discharge from old workings to the surface. Most of the abandoned mine workings in the area have been sealed and water accumulates predominantly in down-dip workings behind the seals. Ground water inflow to the old mine workings will continue until equilibrium is established between inflow, discharge to the surface, recharge into the subsurface, and the local ground water table.

Ground Water Usage

Of the four primary aquifer systems, only the alluvial/colluvial aquifer yields sufficient water to serve as a reliable source of water for beneficial use. A number of individuals, water user associations, government agencies, and corporate entities hold ground water rights for alluvial/colluvial wells in area

drainage, shallow wells that intercept perched aquifers, and numerous small springs and seeps. Water rights have been filed on mine inflow or stored mine water in four mines in the area.

Actual ground water use within the hydrologic basin is primarily limited to large volume municipal and irrigation use or small volume stock watering applications. The Price River Water Improvement District extracts water for municipal use from ground water wells in Sections 23 and 24 of T. 12 S., R. 10 E. Along the Price River valley, especially near Heiner, Martin, and Helper, numerous individuals and corporations have significant water rights that are used for irrigation. Additionally, PacifiCorp owns significant water rights for water from their UGW well located in Section 35 of T 12 S, R 9 E.

In certain areas the perched ground water and stored underground mine water systems may provide water of sufficient quantity and quality for specific uses such as stock watering.

V. MATERIAL DAMAGE CRITERIA - RELEVANT STANDARDS AGAINST WHICH PREDICTED IMPACTS CAN BE COMPARED.

Standards of quality for waters of the State of Utah are set by the Utah Department of Environmental Quality and the state Division of Water Quality, R317 (Utah Administrative Code). There are also primary (PDW) and secondary (SDW) drinking water standards set by the Division of Drinking Water in Rules for Public Drinking Water Systems, R309 (Utah Administrative Code). The drinking water standards are generally more stringent than the water quality standards when a parameter is listed in both, but many parameters are unique to one set of standards or the other. Standards from both sets of rules were established for Total Dissolved Solids (TDS), total iron, total manganese, and pH. There is a water quality standard for total manganese as it relates to Post-Mining Areas, underground mine drainage after application of best practicable control technology currently available (40CFR Ch.1 Subpart 434.55). There is no drinking water or water quality standard for Total Suspended Solids (TSS).

The level of protection or non-degradation for waters is also determined by the Utah Division of Water Quality. Standards usually vary between classifications. Waters within and adjacent to the permit area are classified as:

- 1C - protected for domestic use with prior treatment,
- 3A - protected for agriculture,
- 3C - protected for non-game fish and other aquatic life
- 4 - protected for agricultural uses.

Beaver Creek and its tributaries are classified for 1C and 3A water uses. The Gordon Creek drainage and its tributaries are classified for 3C and 4 water uses. Identified land uses within the proposed Horizon Mine are wildlife and livestock grazing, recreation, and logging. Areas are not being evaluated for wilderness potential within the CIA. The CIA includes a section of the DNR Wildlife Management Area. Recreational use involves four-wheel driving, camping, and hunting.

The most likely post mining land uses in the CIA for the foreseeable future will continue to be logging, livestock and wildlife grazing, and recreation. The land and waters of the CIA should be maintained or restored to support these uses.

VI. ESTIMATE OF PROBABLE FUTURE IMPACTS OF MINING ON THE HYDROLOGIC RESOURCES

Regulatory requirements R729.100 require the Division to assess the probable impacts of coal mining on the hydrologic system. Additionally, each mine in the CIA is required to provide an assessment of the following:

- Whether adverse impacts may occur to the hydrologic balance;
- Whether acid and toxic forming materials exist which could result in contamination of surface or ground water supplies;
- What impacts coal mining and reclamation activities will have on; sediment yield; acidity, total suspended solids, dissolved solids and other important water quality parameters; flooding or streamflow alteration; groundwater and surface water availability; other characteristics required by the Division;
- Whether the proposed surface mining and reclamation activity will result in contamination diminution or interruption of an underground or surface source of water in the permit or adjacent area which is used for a legitimate purpose.

The assessment of the Probable Cumulative Hydrologic Impacts (PCHI) will address each element that the individual mine operations are required to address. The last item will be handled under "Material Damage Determination" in this CHIA. The PCHI assessment will include consideration for those measures used to minimize impacts in mining operations and will be assessed for risk analysis based on past mining experiences and site specific information.

Adverse Impacts to the Hydrologic Balance

The hydrologic balance is defined under the regulatory requirements R645-100: "'Hydrologic Balance" means the relationship between the quality and quantity of water inflow to, water outflow from and water storage in a hydrologic unit such as a drainage basin, aquifer, soil zone, lake, or reservoir. It encompasses the dynamic relationships among precipitation, runoff, evaporation, and changes in ground and surface water storage."

Potential Changes in Ground Water Quantity

Potential changes in groundwater quantity can result from mining. **Table 5** presents a risk assessment of the potential mining related impacts to the hydrologic system. Risk is rated as High (H), Moderate (M), and Low (L). Potential changes and site specific information on the hydrologic system is also discussed.

TABLE 5
GROUND WATER QUANTITY POTENTIAL IMPACTS

Source	Potential Change in Hydrologic Regime	Mining related factor	Mining related operations used to minimize impacts or, site specific characteristics affecting the potential for impact.	Evidence of existing and past water quantity changes that may be attributed to mining.	Risk that a mining related factor may occur.	Risk to quantity of a water use
Springs	Dewatered	Subsidence induced fractures propagating through perched aquifers associated with springs.	Most surface springs issue from the upper geologic units of the Blackhawk. Massive Sandstone units exist above the coal to be mined diminishing potential for surface expression . Numerous surface springs are present above previously mined areas.	No diminished flows have been documented by previous mining activities.	M-L	M
		Dewatering fractures associated with springs.	Operations are designed to avoid the major fault system. Numerous smaller fault/fractures are present. A fracture associated with HZ-91-1 will be mined through. No springs were identified as associated with this fault.	Mining through a graben in Gordon Creek #3 and #6 resulted in 400 gpm inflow but, no decrease in discharge was documented for any springs.	M	M
		Change in direction of Piezometric surface dewatering springs	A limited number of springs issue from aquifers below the coal. Geologic structure, dip, location and orientation could result in interruption of springs issuing below the mine but, they should re-issue following reclamation.	Excess water encountered from mining has not been discharged from portals in previous mined areas. An estimated excess of 50 gpm was predicted may off set flow losses if they occur.	H	M
	Increased Discharge	Sumping or redirecting in-mine water could result in increased recharge to springs within and below the mined sections.	Dewatering of aquifers above the coal may increase recharge to aquifers below mined areas. Interbedded shales may limit vertical movement.	Vegetative changes may be the result of increased flows from Springs in Coal Canyon and may be mining related.	H	L
	Change in location of discharge	Sumping or redirecting in-mine water could result in a change in location of springs	Location of sumps in mine, dip of coal beds and location of fractures in the system may have an affect on where springs are relocated.	New springs issuing from the canyon west of Coal Canyon may be mining induced.	H	L
		Subsidence could cause surface springs to relocate.	Subsidence is not expected to reach the surface.	No known subsidence has changed the location of springs in this area.	L	L

TABLE 5
GROUND WATER QUANTITY POTENTIAL IMPACTS (cont.)

Source	Potential Change in Hydrologic Regime	Mining related factor.	Mining related operations used to minimize impacts or, site specific characteristics affecting potential for impact.	Evidence of existing and past water quantity changes that may be attributed to mining.	Risk that a mining related factor may occur.	Risk to quantity of a water use.
Aquifers Above Coal	Increased Recharge	Increased recharge may occur due to subsidence above the coal seam.	Increased recharge to aquifers above the coal is unlikely unless fractures heal between aquifers. Clays have been considered to have sealing characteristics between water bearing zones. Overburden between the coal and most surface water is greater than 800 feet.	The old Sweet's mine may have subsidence fractures near the surface in areas where overburden is shallow. Drill holes indicate zones above mined areas are dry.	H	L
	Increased discharge or, de-watering.	Increases in hydraulic conductivity from caving and fracturing above the mined zone.	Few aquifers have been identified above the coal that are known to issue as a spring or associated with a water right.	Most in- mine waters were stated to come from isolated channel sandstone.	H	M
Aquifers Below Coal	Increased recharge and discharge rates.	Increases in recharge may occur due to location of sumps and due to dewatering aquifers above the mine or, increasing hydraulic conductivity between overlying aquifers. New discharge locations may occur.	Mine operations including location of sumps, and mine water discharge rates may affect the rate of recharge to aquifers below the coal. Following reclamation increased recharge may occur from intercepting aquifer waters above the coal. The aquifers below the coal are separated by clay and shale layers that may impede flow to lower aquifers.	An increase in discharge may have occurred in the Storrs Sandstone of the Star Point aquifer. New seeps are present in a canyon west of Coal Canyon below the mined zone.	H	L-M
Mined Coal Zone	Change in Hydraulic Conductivity.	Due to the removal of coal and subsidence above the coal the hydraulic conductivity will be changed.	The amount of coal removed will dictate total influence.	No related information has been presented from previous mining in the CIA.	H	M

Evaporative Losses

Presently the mines at Gordon Creek #2, #7 and #8, and Gordon Creek #3 and #6 are under reclamation and all mine associated openings are presently sealed. The proposed mine ventilation in the Horizon Mine is expected to evaporate an average of 5.66 gpm from air circulating through the mine at 200,000 cfm.

Mine Water Discharge

Mine water was produced and has been discharged from the Gordon Creek #3 Mine and most recently the Horizon Mine. The Gordon Creek #2, #7 and #8 Mines did not produce enough mine water to be discharged.

The Gordon Creek #3 Mine produced water when it mined through a 14 foot fault. The mine had to pump water daily. The mine workings are located in a fault block, the south side of the block and limit of mining lies against a 40 foot fault. The fault block is part of the down thrown block of the Fish Creek Graben (**Figure 6-6 and 6-2, Horizon MRP**). The National Mine workings were developed on the adjacent side of the fault. Some of the National Mine workings extended across the fault and laid west of the Gordon Creek #3 Mine workings. Dan Guy mentioned that a couple times during the development, Gordon Creek #3 Mine operations broke into the National Mine working, which had to be sealed. The fault intersects the creek in Coal Canyon at about 7400 ft level.

When mine water was discharged from the Gordon Creek #3 Mine and Horizon Mine, it was discharged to the sedimentation ponds until water quality tests show it met the standards to discharge it into the stream, under a UPDES permit.

Mine water is currently being discharged from the Horizon Mine. The mine has reached a level that the operators think is the hydrostatic head (water table) in the upper member of the Starpoint Sandstone. While mining into the current location, the mine was discharging several hundred gallons per minute. The operator thought that water stored in the old mine workings of the Blue Blaze #3 Mine was seeping into the sandstone unit and out of the floor of the Horizon Mine.

Change in the Potentiometric Surface

There is insufficient data from early mining operations to determine what elevation the potentiometric surface of aquifers within, above and below the coal seams was prior to any mining. Mining activity has occurred in the Castle Gate "A" seam and has occurred in the Hiawatha seam, which may have dewatered aquifers previously existing. No monitoring well data exists from these previous mining activities.

A potentiometric map for the Spring Canyon Sandstone was developed for the Horizon mine plan by establishing monitoring wells. The wells show that the Spring Canyon Tongue has a hydraulic gradient of 0.014 in an east-southeast direction based on December 1995 data. The overlay of the potentiometric surface and elevation of the Spring Canyon Tongue was used to estimate the saturated portion of the coal formation.

Data obtained in July through September 1996, indicate the surface water elevation had remained relatively steady in Well HZ-95-2. Other water levels had changed. Water elevations decreased by approximately five feet at well HZ-95-3 and increased by seventeen feet at HZ-95-1. Currently it is not known whether the potentiometric surface has stabilized, or if it is controlled by seasonal variation. The September, 1996 data indicate that the potentiometric surface has a gradient of 0.019 ft/ft and the general direction of flow is the same but, flows a little more southerly than the December, 1995 data indicated.

Groundwater was observed in the HZ wells above the Star Point formation and was present from 100 to 600 feet below the ground surface. The presence of water indicates a potential for aquifers to be present above the Hiawatha seam in areas that were not previously mined. Well HZ-95-1-S was completed above the Hiawatha at 205 to 210 foot depth. Two drill holes

previously drilled by Beaver Creek Coal Company near Beaver Creek were artesian flow and are referred to as BC-1 and BC-2. Water from these drill holes is assumed to originate from 80 to 100 feet below the ground surface.

Artesian aquifers suggest that some water rests on aquitards or are overlain by confining units, or may be recharged from a fracture system with hydraulic head above the issuing point. Additionally, most springs in the CIA issue above the presented potentiometric surface of the Star Point. This may indicate that the Star Point is not in connection with overlying fractures or, due to low hydraulic conductivity of the lower formation, water transmission may occur slowly causing the water to be retained and discharge through springs associated with fractured systems near the surface.

Wells have not been completed fully through the Star Point Formation. The Star Point sits over shale members through the proposed permit area potentially blocking vertical flow below the aquifer. However, where there are fracture related flows, water has issued from formations below the Star Point. No wells were completed in the Blackhawk, where the coal is to be mined.

The elevation of water in HZ-95-1 was 7585.4 feet msl in July 1996. The standing water elevation in the Blue Blaze No. 1 Mine was 7,587 ft msl on 5/16/96, and 7,585 ft msl on 6/14/96; similar to the surface elevation in HZ-95-1. This could indicate an interconnection with the in-mine water and the fracture, but could also be due to local influences. The base of the Hiawatha at Well HZ-95-1 is approximately 7,331.6 feet msl; at HZ-95-3 approximately 7,477.6 ft msl; and HZ-95-2 is approximately 7,189.3 ft. msl (a 288 ft. difference between HZ-95-3 and HZ-95-2) and is outside the proposed mining area on the side opposite the fracture associated with the graben. The potentiometric surface elevation presented indicates the Star Point aquifer is in connection across the fracture of the graben. The elevation to which coal is removed could potentially decrease the potentiometric surface in the CIA.

The Hiawatha Coal Seam will be saturated from the beginning of mining operations. The rate of inflow will depend primarily on whether a faulted zone is encountered that contains groundwater in storage or, that is in connection with an overlying perched aquifer. The potential sustained inflow occurring from future operations was estimated to be 50 gpm.

Inter-mingling of Aquifer Waters

Intermingling of aquifer waters could occur if subsidence induced fracturing increased localized porosity across aquifers. Subsidence could occur where full extraction mining is planned. In most areas the overburden ranges over 600 feet, sufficient to minimize fracturing on the surface. Subsidence impacts are not as catastrophic with room and pillar mining (planned by Horizon Mine) as seen when using longwall equipment. There should be no subsidence impacts to streams with this permit proposal, since no mining will take place under perennial streams.

Surface Water Quantity

Surface water quantity may be affected by changes to the groundwater system. The interaction of these systems and the geologic system may influence quantity of surface water flows. Table 6 presents a risk assessment of the potential for a mining related factor to affect

the hydrologic system and the potential that a quantity of use may be affected by these changes. Risk is rated as High (H), Moderate(M), and Low (L). Additional potential changes or site specific information on the hydrologic system is also discussed below.

TABLE 6
SURFACE WATER QUANTITY POTENTIAL IMPACTS

Source	Potential Change in Hydrologic Regime	Mining related factor.	Mining related operations used to minimize impacts or, site specific characteristics affecting potential for impact.	Evidence of existing mining characteristic	Risk that a mining related factor may occur.	Risk to quantity of a water use.
Jewkes Creek	Loss of stream flow	Subsidence induced fractures propagating to the surface.	The mine operations are set up to avoid mining under this stream. And a stream buffer zone has been designated.	This stream has not been mined under in the past.	H	L
		Interception of water from fractures and aquifers that depleat baseflows.	Mine operations were set up to avoid mining into the fracture associated with this stream. Much of the water originates from springs outside the area proposed to be mined.	No changes in streamflow have been noted on Jewkes Creek related to mining the area.	M-L	L
	Increases in stream-flow.	Increases in streamflow could occur from mine water discharges, increased hydraulic conductivity between aquifers above the coal and, transbasin diversions.	Mine operations can be set up to control discharge rates. Significant aquifers directly above the coal seam have not been identified.	No changes in streamflow have been documented on Jewkes Creek related to previously mining the area.	M	M
	Seasonal Changes	Mine water discharge could potentially increase summer season baseflow. Following reclamation increased conductivity may seasonally increase or decrease discharge based on retention time of the system.	Operations can control sumping locations and thereby control mine discharge rates during mining. Although discharging may be desirable. Clay swelling and settling of overburden over time may decrease the hydraulic conductivity of the system following mining.	Excess of in-mine water is predicted to be discharge at a rate of 50 gpm. Because most discharge from Jewkes creek is from springs not expected to be impacted changes following reclamation are not expected.	H	M
Beaver Creek	Decreased Baseflows	Decreased base flow could occur if springs are dewatered or, if streams in connection with fractures are dewatered during mining or, if subsidence propagates fractures to the surface increasing losses.	Massive sandstone units are believed to be important in reducing propagation of fractures to the surface. Clays are believed to swell shut and reduce flow potential in fractures. Where fractures may be dewatered stream losses would be related to the rate of flow through the alluvium to the fracture.	Previous mining has occurred under Beaver Creek without documented losses in baseflow although this is a limited data base.	M	M
	Trans Basin Diversions	Could occur through intercepting surface waters and springs in Beaver Creek which are discharged into the Gordon Creek Basin.	Interception of Springs and surface waters in the Beaver creek drainage is not expected. Increased porosity and dewatering of fractures may increase vertical migration of water and result in losses from the Beaver Creek drainage to Gordon Creek	No springs or surface waters have been documented to be intercepted through past mining practices although the data base is limited.	M	M

TABLE 6
SURFACE WATER QUANTITY POTENTIAL IMPACTS(cont.)

Source	Potential Change in Hydrologic Regime	Mining related factor.	Mining related operations used to minimize impacts or, site specific characteristics affecting potential for impact.	Evidence of existing mining characteristic	Risk that a mining related factor may occur.	Risk to quantity of a water use.
North Fork Gordon Creek	Decrease in Streamflow	Reduced flows from dewatering fractures and aquifers depleting surface flows.	Relative location downstream of mine operations may result in temporary losses during mining operations and should recharge following reclamation. Mine water discharge may result in no net change if mining intercepts these waters.	No noted decreases have been identified in past operations although data base is limited.	L	L
	Increase in Streamflow	Increases could occur from transbasin diversions. Dewatering perched aquifers and fractures.	The lower stream segment is below the base of the Hiawatha and may receive increased base flow if increased recharged occurs from mining activities.	Mine water discharge has not occurred in previous mining activities but, is predicted to occur. Increased discharge from springs along Coal Canyon have been noted.	M	M
	Seasonal Changes	Seasonal changes could occur due to increased hydraulic conductivity reducing residence time in the aquifers.	The equilibrium the system reaches following mining will determine whether seasonal changes may occur. The because the existing system is highly fractured increased conductivity may not significantly affect seasonal flows.	Seasonal changes have not been noted from past mining although the data base is limited.	M	L

Presence of Acid- or Toxic-Forming Materials

Results of the chemical analyses in Table 6-5 of the MRP summarize the acid and toxic nature of the Hiawatha coal seam in the CIA. The acid base potential determined from data analyses of the HZ-series drill cores indicate the Hiawatha coal has a potential to be acid-forming. While overburden and underburden have a high neutralization potential (20.3 to 64.0 tons of CaCO_3 per 1000 tons).

Tests for Acid and Toxic forming materials were conducted on roof and floor samples in LMC-4 and HZ drill holes from the Hiawatha mine. The acid base potential of each of the three coal samples collected from the HZ-series holes indicate that the coal has a potential to be acid-forming with values from -9.1 to -13.6 tons CaCO_3 per 1000 tons of material. (Section 6.5.6). Tests for Acid and Toxic forming materials were conducted on roof and floor samples in LMC-4 and HZ drill holes. One sample contained a high pyritic sulfur content of 0.24 percent. Core samples of the coal obtained from the Hiawatha Seam analyses show total sulfur contents from 0.38 % to 0.61 % of which 0.02 % to 0.07% is shown to be Pyritic Sulfur.

Water Quality Impacts

Changes in ground water quality may occur through contamination from the following: acid- or toxic-forming materials, hydrocarbon and chemical contamination, other materials associated with mining activities. Changes in surface water quality may occur due to contamination from the following: acid- or toxic-forming materials, hydrocarbon and chemical contamination, other materials associated with mining such as rockdust, increased sediment yield from disturbed areas, flooding or streamflow alteration.

Increased Sediment Yield from Disturbed Areas.

Sediment yield is one of the major problems identified for any construction or development project. Exposed soils are susceptible to erosion. In developing mines and operating mining equipment at mine sites soils are exposed to the elements creating dust and mud that can be washed off site.

Under SMCRA, mining operations are required use sediment control structures to divert undisturbed flows away from the disturbed areas, control flow disturbed area runoff and capture sediments to prevent them from leaving the disturbed area of the minesite.

Mining activities at the Horizon and Gordon Creek 2,7 and 8 mines have a potential of contributing sediment to Jewkes Creek and the North Fork of Gordon Creek during mining activities. Recently logging activities has caused a large amount of sediment to flow onto the permit area. When logging concludes, it is expected that this condition will decrease to lower rates.

The Gordon Creek #2, #7, and #8 mines is under reclamation. Some contributions of sediment may be expected from this area until the vegetation is adequately established at the site. Presently most disturbed area sediment reports to sedimentation ponds on site. One small area does not report to the pond and has proposed alternate sediment control measures. The Gordon Creek #3, and #6 Mines have met all requirements for reclamation, including a 10 year bond period, and have received bond. The permitted land has been returned to post mining conditions and turned back to the landowner.

Acidity

Past mining practices have probably increased pH, rather than increased acidity. Acidity is not considered to be a potential impact from mining in this region. All of the coal will not be removed in the mining process and much of this coal will be in contact with air and water during the mining operations and may cause a lowering in the pH of those waters. Currently water from the old Blue Blaze No.1 mine workings are shown to have a pH of 6.8 to 7.66. In general, these are lower than the surrounding area pH values, but does not fall into a range where the pH would affect a use. Coal will be stored on the surface for short periods and run off from the coal stockpile will be routed through the sedimentation pond where it will mix with run off water that is more alkaline. Acid forming discharges are uncommon in the region and acid forming materials are not known to be extensive in Utah coal mines. Should the presence of pyrite in the

mine area cause a decreased pH locally the mixing with higher pH waters in the system would result in localized affects in the permit area and would not likely occur off the permit area due to downstream buffering.

Storage of coal in the mine yard will be short-term. As coals are stockpiled, coals with low acid-base potential will become blended with more alkaline coals and the potentially acid-forming effects will be reduced. Coal fines that are washed from the stockpile will be stopped at the sediment pond and will be subject to the same testing, treatment, and disposal as the rest of the sediment. If precipitation produces acidic run-off from the coal stockpiles, it will tend to be neutralized by the alkaline nature of the mine yard substrate. Runoff will be collected at the sediment pond.

Total Suspended Solids

A probable consequence of surface disturbance is increases in sediment loading and increases in total suspended solids (TSS) from the disturbed area.

Total Dissolved Solids

Contact between; disturbed area runoff and materials exposed to weathering and oxidation; drainage from coal refuse and mine waste storage areas; and discharge of excess mine drainage, may result in increased TDS and in increased individual constituents. Potential increases may be effectively addressed on a short term basis by establishment of the drainage and sediment control system and through compliance with discharge effluent limitations of the UPDES permit. The present permit limitations for TDS discharged from all mine water and decant operations is limited to one ton per day to Jewkes Creek.

Other Materials Associated with Mining

The road to the mine is maintained as a gravel road, therefore, the use of road salting is not likely to affect water quality. However, the county has requested magnesium chloride as a road dust suppressant which may increase the magnesium present in the system. No longwall mining is proposed so spills from longwall mining fluid is not expected. If a calcium carbonate rock dust is used in-mine it should not change the general signature of the water characterized as a calcium bicarbonate type water. If calcium sulfate is used an increase of sulfates may occur in the surface waters or waters discharged by springs below the mine.

Hydrocarbon Contamination

Diesel fuel, oils, greases and hydrocarbon products will be stored above-ground and may be spilled in the mine and on the surface during mining operations. Proposed concrete containment structures and Spill Prevention and Contamination Control Plan will minimize the potential for impacts.

Flooding or Stream Flow Alteration

The potential for flooding is diminished during operations for those flows within the disturbed area which are less than the 10-year, 24-hour event by reducing peak flows through attenuating water in the sedimentation pond. Upstream drainages will be transported through a bypass culvert below the pad. It is likely that the water flowing through the culvert will have increased flow velocity over the natural velocities for the same discharge rates. Operational designs include a discharge pool downstream of the sedimentation pond and riprap at the culvert outlet to protect streamflow alteration from the 100 year - 6 hour event. Currently the waters that exit from Portal Canyon are collected behind the waste embankment and are evaporated, used by vegetation, or seep through the waste pile. The reclamation of Portal Canyon will return the ephemeral flows from this canyon directly to Jewkes Creek. The reclamation channel will be designed in order to encourage development of riparian vegetation in Jewkes Creek. Other potentials for streamflow alteration include an increased discharge through the operation period due to mine dewatering. This flow may promote downstream vegetative growth that may encourage stability during the operating phase.

Past mining has caused a reduction in streamflow. The Sweets mine is suspected to be intercepting surface waters in Bryner Canyon at the #2, #7 and #8 mine. It is not known where this flow re-issues but, it is suspected that it may re-issue in Sweets Canyon. This water has not been determined to result in contamination diminution or interruption of a legitimate use.

VII. MATERIAL DAMAGE DETERMINATION

The material damage determination is based on the past, present and expected mining and the associated changes that may be expected to occur to the water resources from mining operations. These changes constitute material damage if the change causes the loss of a legitimate use in quantity or quality. Replacement or mitigation for a legitimate use may result in no net loss of the legitimate use. Criteria that are used to determine material damage to hydrologic resources in coal mining programs administered by other states or by the Federal Office of Surface Mining (OSM) include:

- Actual or potential violation of water quality criteria established by federal, state, or local jurisdictions.
- Changes to the hydrologic balance that would significantly affect actual or potential uses as designated by the regulatory authority.
- Reduction, loss, impairment, or preclusion of the utility of the resource to an existing or potential water user.
- Short term (completion of reclamation and bond release) impairment of actual water uses that cannot be mitigated.
- Significant actual or potential degradation of quantity or quality of surface water or important regional aquifers.

Each factor addressed in the Probable Hydrologic Impacts that may affect a water use will be discussed to indicate whether material damage is expected to occur to a legitimate water use. The reasons for the determination of potential for risk to a water use is discussed further.

Adverse Impacts to the Hydrologic Balance:

Ground water Regime

Although fracturing and faulting is abundant in the CIA, mining of areas adjacent to a water bearing fault have been indicated to be dry. Mining through water bearing faults near the Gordon Creek #2 mine has not resulted in any documented loss or dewatering of springs in the CIA. One fracture associated with well HZ-95-1 will be mined under but no documented springs are associated with that fracture. A change in the piezometric surface may dewater springs issuing from the Star Point in Coal Canyon and the canyon west of Coal Canyon, however, it is not known whether these springs are in hydrologic connection with the area to be mined. If the spring water is in connection with the mine, the water pumped from the mine probably would offset the losses from the springs. Due to the location and elevation of the fractures relative to mining, it is likely that water would re-issue from the springs when the potentiometric surface recovers following mining. Therefore, no material damage is expected to occur to the quantity of downstream water use.

Increased Discharge in Springs

Increases in discharge of springs below the coal to be mined is possible following mining but, is less likely to occur during mining. Dewatering of water bearing zones that do not issue to surface springs or increased hydraulic connection to aquifers above the coal may increase discharge. Increased discharges may have occurred along a fracture in Coal Canyon as evidenced by a vegetative change to wetland species in the discharge area. Increased discharges have not been demonstrated to adversely affect quantity of legitimate water uses. (Increased ground water recharge and discharge are considered to have similar results).

Change in Location of Spring Discharge

Changes in location of discharge might occur at low points of fractures and below the mined area. Currently new springs have issued in a drainage west of Coal Canyon. It is probable that these springs are discharging from a flooded, mined out, area.

Changes in spring locations may also occur due to subsidence. The perched aquifers of the Blackhawk Formation are lenticular and localized, the stratigraphic sequence has over all low permeability. If fractures reach the surface the springs may be re-adjusted and discharged at another surface location. Past experience presented no documented cases of relocation of springs due to subsidence. Since mining of the Blue Blaze #3 mine was already mined above the proposed mine, it has been assumed that there will be not material damage to legitimate uses associated with springs due to subsidence.

Increased Groundwater Recharge

Propagation of subsidence to the surface could result in increased recharge. Increase recharge to the Sweets mine has probably occurred through surface water interception along Bryner Canyon. This area has been mined with little overburden. The proposed mining operations have a greater depth of cover and mining of the Castle Gate "A" seam and Hiawatha seam with similar overburden has not resulted in any documented cases of subsidence fractures. Increases in recharge to the aquifers above the coal is not likely because those aquifers influenced will probably drain to the mined area. Increases in recharge of aquifers within and below the coal is likely, but has not adversely effected the quantity of the proposed use.

Changes in Hydraulic Conductivity

Changes in hydraulic conductivity may change the timing and rates of discharge to springs and surface waters. With an increase in hydraulic conductivity the high flow periods could potentially flow at greater rates leaving less water available for low flow rates. Since the stratigraphic sequence has a low overall permeability and is interbedded with clays it is expected that increased hydraulic conductivity above the coal would eventually seal and decrease the hydraulic conductivity over time. The hydraulic conductivity of the mined areas is likely to change where room and pillar mining occurs. These zones will fill and come into equilibrium with the rate of recharge. Since no significant base flow contributions from this zone have been identified it is not expected to have an impact on the surface water in the area following mining and equilibrium with the system.

Surface Water Regime

Jewkes Creek may see increased flows during the period of mining operations due to mine de-watering. The predicted inflows and predicted use suggest this value will change by approximately 50 gpm. The sumping operations, use and consumption of water in mine will dictate the rate of discharge. In most mining operations this has increased water availability during low flow. Thus, no impacts to quantity for a legitimate water use has resulted during operations. Following operations the discharge rates will occur in equilibrium with the system. No losses of quantity of use have been documented for the areas that have previously been mined. Therefore, it is assumed no material damage will occur in the future.

Beaver Creek is located above the area to be mined. Previously Beaver Creek was under mined for approximately one mile of the stream channel. The Beaver Creek Drainage area mined approximately 284 acres under the Beaver Creek Drainage, The Consumer's Mine mined under 113 acres of the Beaver Creek Drainage and the Gordon Creek #3 and 6 mine mined under 3 acres. Limited data is available and no loss of flow over time has been documented. However, a citizens complaint has suggested that mining has decreased flows in the stream. The first year of monitoring is established to further assess this potential. The fact that the stream is presently flowing indicates this activity probably will not completely deplete surface flows in Beaver Creek. However, increased vertical flow rates could reduce surface flow and would be controlled by the hydraulic conductivity of the alluvium and lower water bearing zones. The rate of increased discharge, if any, would be controlled by the system and could not be predicted.

The North Fork of Gordon Creek has been monitored below the Gordon Creek #2, #7 and #8 Mine. The Sweets mine is suspected to be intercepting surface waters in Bryner Canyon at the Gordon Creek #2, #7 and #8 Mine. It is not known where this flow re-issues but, it is suspected that it may re-issue in Sweets Canyon. The water in the North Fork of Gordon Creek has not been determined to result in diminution or interruption of a legitimate use, therefore, no material damage has been identified. Future mining may change the location of discharge to the stream but, is not expected to cause material damage for the quantity of use.

Surface Water Quality

Water quality outside the permit boundary is expected to be the same as presently observed. The reason for this assessment is due to the large extent to which mining has occurred in the past. Historical baseline information is not available because mining occurred in this area prior to the enactment of SMCRA, therefore, the changes that may have occurred due to mining can not fully be assessed. No material damage to quality of a use has occurred in this area and is not expected to occur.

An evaluation of the data and information received from the applicant, as well as an analyses of germane studies and reports leads to the conclusion that no significant impact will occur to the hydrologic balance as a result of mining the federal lease up to the subsidence protected permit boundary south of Beaver Creek.

The applicant has expressed intentions to conduct future mining in the federal leases north of the proposed permit area, which will likely intersect faults and undermine Beaver Creek and Jewkes Creek as well as some springs. Prior to mining those areas the operator will have to supply baseline information identifying the characteristics of groundwater in and adjacent to the graben, (the block where mining is most likely to be economic and successful).

VIII. STATEMENT OF FINDINGS

An evaluation of the data and information received from the applicant, as well as an analyses of germane studies and reports leads to the conclusion that no significant impact will occur to the hydrologic balance as a result of mining the identified permit area.

All available information indicates that past mining has not caused impacts as a result of subsidence and that there is a very low chance that any streams or springs will be affected during this permit term as a result of mine subsidence.

Future development considerations will include the implementation of monitoring strategies to ensure that adequate information and trends are established.

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AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Carbon,)

I, Kevin Ashby, on oath, say that I am the Publisher of the Sun Advocate, a twice-weekly newspaper of general circulation, published at Price, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for 4 (Four) consecutive issues, and that the first publication was on the 31st day of October, 2000 and that the last publication of such notice was in the issue of such newspaper dated the 21st day of November, 2000.


Kevin Ashby - Publisher

Subscribed and sworn to before me this 21st day of November 2000.



Notary Public My commission expires January 10, 2003 Residing at Price, Utah
Publication fee, \$ 493.00



LINDA THAYN
NOTARY PUBLIC - STATE OF UTAH
845 EAST MAIN
PRICE, UTAH 84501
COMM. EXP. 1-10-2003

**PUBLIC NOTICE
APPLICATION FOR PERMIT EXPANSION
LODESTAR ENERGY, INC.
HORIZON NO. 1 MINE**

Notice is hereby given that Lodestar Energy, Inc., on or about August 21, 2000 submitted a permit application to extend the Permit Area for Permit ACT/007/020 covering operations for the Horizon No. 1 Mine, to the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining.

Approval by the Division of Oil, Gas and Mining, will allow coal mining operations to expand into a part of the Beaver Creek Coal Lease UTU-74804 held by Lodestar Energy, Inc. The lands involving activities are located in Carbon County. The mine portals are located 14 miles west of Price, Utah in the Gordon Creek - Consumers Canyon area. The permit area lies within the USGS Jump Creek, Utah 7.5 minute quadrangle.

The permit area includes land in the following:

Township 13 South, Range 8 East, SLM

Section 8: W1/2SE1/4, SE1/4SW1/4, S1/2SW1/4NE1/4, S1/2NE1/4SW1/4,
NE1/4NE1/4SW1/4NE1/4, S1/2SW1/4SW1/4, NE1/4SW1/4SW1/4,
S1/2NW1/4SW1/4SW1/4, S1/2NE1/4SW1/4NE1/4, NE1/4NE1/4SW1/4,
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Section 17: NW1/4NE1/4, N1/2NW1/4SW1/4, NE1/4SW1/4, NW1/4SE1/4,
N1/2SE1/4SW1/4, N1/2SW1/4SE1/4, SW1/4NE1/4, NW1/4

Section 18: NE1/4NE1/4

Section 7: SE1/4SE1/4SE1/4, S1/2SW1/4SE1/4SE1/4, NE1/4SW1/4SE1/4SE1/4,
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Containing 711 acres more or less.

Copies of the complete permit application are available for public inspection at Utah Division of Oil, Gas and Mining, 1594 West North Temple, Suite 1210, Salt Lake City, Utah 84114-5801.

Written comments, objections, and requests for informal conferences regarding the Permit Application must be submitted, within 30 days of the date of the publication of this notice, to the Utah Coal Regulatory Program, 1594 West North Temple, Suite 1210, Salt Lake City, Utah 84114-5801.

Published in the Sun Advocate October 31, November 7, 14 and 21, 2000.



State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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Governor

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February 20, 2001

TO:

Compliance File

FROM:

Pamela Grubaugh-Littig, Permit Supervisor *PGL*

RE:

Compliance Review for Section 510 (c) Findings, Lodestar Energy, Inc., Horizon Mine, C/007/020-SR00B

As of the writing of this memo, there are no NOV's or CO's which are not corrected or in the process of being corrected. There are no finalized Civil Penalties, which are outstanding and overdue in the name of Lodestar Energy, Inc. Lodestar Energy, Inc. does not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

The Applicant Violator System (AVS) did not contain any information that would deny approval of this permitting action. (See attached, dated February 16, 2001.)

sm

Attachment:

O:\007020.HZN\COMPLIANCE\AVS_SR00B.DOC

Application Evaluation Report Applicant Violator System 16-Feb-2001 09:11:26

State : UT Permit No : ACT007020

Appl No : ACT007020

Permittee : 144419(LODESTAR ENERGY INC)

Seqno : 2

Applicant : 144419(LODESTAR ENERGY INC)

OSMRE: Comments/Analysis: Date : 16-Feb-2001 Mode : VIEW

The applicant is excluded on associated AIL debt. au

SRA: Comments/Analysis: Date : 16-Feb-2001 Mode : UPDATE

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CHOICES(F10)

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United States Department of the Interior
FISH AND WILDLIFE SERVICE

UTAH FIELD OFFICE
LINCOLN PLAZA
145 EAST 1300 SOUTH, SUITE 404
SALT LAKE CITY, UTAH 84115

UTAH DIVISION OF
OIL, GAS AND MINING

In Reply Refer To

(CO/KS/NE/UT)

February 22, 2001

Mr. Darron Haddock, Permit Supervisor
Utah Division Oil, Gas, and Mining
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, Utah 84114-5801

Heening
2/007/020

RE: Section 7 Consultation on the Beaver Creek Tract, Lodestar Energy Inc., Horizon Mine,
C/007/020-SR00B

Dear Mr. Haddock:

The U.S. Fish and Wildlife Service (Service) has reviewed your letter of December 13, 2000. Potential impacts to proposed or listed species from mining activities have been previously addressed in the Service's September 24, 1996 Biological Opinion and Conference Report on Surface Coal Mining and Reclamation Operations under the Surface Coal Mining and Reclamation Act of 1977. As part of the terms and conditions of this BO, the regulatory authority must implement and require compliance with any species-specific protective measures developed by the Service field office and the regulatory authority. No species-specific protective measures are considered necessary for the subject project.

We concur with your "no effect" determination for the black footed ferret and bald eagle. However, we do not concur with your "no effect" determination for the razorback sucker, humpback chub, bonytail, and Colorado pikeminnow.

The project proposes continued annual water use of approximately 60 acre-feet. In addition, there could be disruption of surface and groundwater flows due to subsidence fractures. Water depletions from the Upper Colorado River Basin are considered to jeopardize the continued existence or adversely modify the critical habitat of the four Colorado River endangered fish species: Colorado pikeminnow, razorback sucker, bonytail, and humpback chub. However, depletions are addressed by existing inter-agency section 7 agreements. In 1998, the Department of the Interior, the states of Wyoming, Colorado, and Utah, and the Western Area Power Administration established the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (RIP). The purpose of the RIP is to recover listed species while providing for new water development in the Upper Colorado River Basin. In accordance with the RIP, the Service assesses impacts of projects that require section 7 consultation and determines how the RIP will serve as a reasonable and prudent alternative.

For new depletions less than 100-acre feet, an intra-service agreement based on basin-wide cumulative depletions precludes the need for a depletion charge and the RIP recovery activities are considered adequate to offset depletion impacts. Therefore, the depletion fee for this project is waived. It is important to note that the Service is required to consult on and keep track of all depletions, historic or new, of any magnitude. Therefore, UDOGM should report all water depletion to our office. In addition, groundwater and surface water flows in the project area should be closely monitored. Any additional loss of water should be immediately reported to this office.

Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered. Only a Federal agency can enter into formal Endangered Species Act section 7 consultation with the Service. A Federal agency may designate a non-Federal representative to conduct informal consultation or prepare a biological assessment by giving written notice to the Service of such a designation. The ultimate responsibility for compliance with ESA section 7, however, remains with the Federal agency.


As you are aware, the peregrine falcon was removed from the federal list of endangered and threatened species per Final Rule of August 25, 1999 (64 FR 46542). Protection is still provided for this species under authority of the Migratory Bird Treaty Act (16 U.S.C. 703-712) which makes it unlawful to take, kill, or possess migratory birds, their parts, nests, or eggs.

We recommend use of the *Utah Field Office Guidelines for Raptor Protection from Human and Land Use Disturbances* which were developed in part to provide consistent application of raptor protection measures statewide and provide full compliance with environmental laws regarding raptor protection. Raptor surveys and mitigation measures are provided in the Raptor Guidelines as recommendations to ensure that proposed projects will avoid adverse impacts to raptors, including the peregrine falcon.

We appreciate your interest in conserving endangered species and migratory birds. If further assistance is needed or you have any questions, please contact Laura Romin, at (801) 524-5001 extension 142.

Sincerely,



 Henry R. Maddux
Utah Field Supervisor

cc: Sandy Vana-Miller, Office of Surface Mining, 1999 Broadway, Suite 3320, Denver, CO 80202

Colorado River Recovery Program, RO, Denver



State of Utah

GOVERNOR'S OFFICE OF PLANNING AND BUDGET Resource Development Coordinating Committee

Michael O. Leavitt
Governor

Brad T. Barber
State Planning Coordinator

James L. Dykmann
Committee Chairman

John A. Harja
Executive Director

116 State Capitol Building
Salt Lake City, Utah 84114
(801) 538-1027
Fax: (801) 538-1547

December 11, 2000

Pam Grubaugh-Littig
Division of Oil, Gas & Mining
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

*Copy to Aaron
12/10/00
Incoming*

SUBJECT: ~~Determination of Administrative Completeness for Federal~~ Lease Addition Lodestar
Energy, Inc., Horizon Mine ACT/007/020-SR00B
State Identification Number: UT001031-010

Dear Ms. Grubaugh-Littig:

The Resource Development Coordinating Committee (RDCC), representing the State of Utah, has reviewed this proposal. The Division of State History comments:

After review of the material provided, the Utah Preservation Office concurs with a determination of No Historic Properties Affected for the project.

If you have questions, please contact Jim Dykmann at (801) 533-3555. (Please refer to Case No. 00-1633).

The Committee appreciates the opportunity to review this proposal. Please direct any other written questions regarding this correspondence to the Utah State Clearinghouse at the above address or call Carolyn Wright at (801) 538-1535 or John Harja at (801) 538-1559.

Sincerely,

John A. Harja
for Natalie Gochnour
State Planning Coordinator

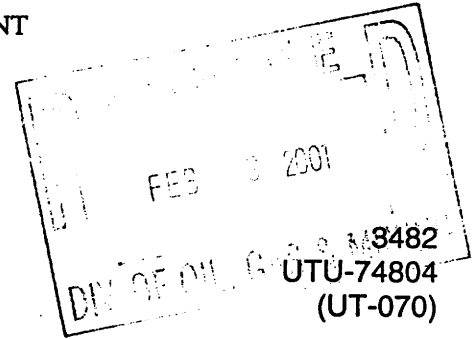
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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Price Field Office
125 South 600 West
Price, Utah 84501



CERTIFIED MAIL - RETURN RECEIPT REQUESTED
Certified No. 7099 3400 0006 5092 6217

Mr. David B. Miller
Lodestar Energy, Inc.
HC 35 Box 370
Helper, Utah 84526

Re: Minor Amendment to Resource Recovery and Protection Plan (R2P2) Horizon Mine, Lodestar Energy, Inc., November 4, 1999

Dear Mr. Miller:

On January 30, the Bureau of Land Management (BLM) received Lodestar Energy, Inc.'s request for a minor amendment to the approved Resource Recovery Protection Plan (R2P2) for the Horizon Mine. This letter is to notify you that the BLM has completed our review of Lodestar Energy, Inc.'s minor amendment to the approved R2P2 regarding the Horizon Mine. The purpose of our review is to determine compliance with The Mineral Leasing Act of 1920, as amended, the regulations at 43CFR 3480, and the lease terms and conditions; and to ensure that maximum economic recovery (MER) will be achieved.

Our determination of the subject minor amendment is as follows:

- ◆ Since DOGM approval for the complete lease is not likely for some time, a new stipulation has been added below allowing for mining south of "Beaver".
- ◆ Recoverable coal reserves for UTU-74804 are 6,295,700 as determined by the May 12, 1998 Engineering and Geologic Report.
- ◆ The actual sequencing and initial date of commencement of mining operations on UTU-74804 will probably change. Once all the permits are in place, a revised sequence and timing map will need to be submitted to the BLM.

Based upon the above-stated requirements, BLM determination is conditioned with the following stipulation:

Original Stipulation: Horizon shall submit the following information (as requested above):

- An updated mine plan that details mining sequencing and any other changes will be submitted when all permits are in place, but prior to commencement of operations on

the Federal lease.

New Stipulation:

- R2P2 approval is for areas south of "Beaver" as shown on the approved R2P2 amended map. Areas north of "Beaver" are NOT to be mined prior to all permits being in place.

BLM has determined that the information contained in the R2P2 amendment for the Horizon Mine with stipulation does comply with the Mineral Leasing Act of 1920, as amended, the regulations at 43 CFR 3480, and the lease terms and stipulations. Thus, approval for the Horizon Mine's R2P2 amendment is granted. If you have any questions, please contact Jay Marshall at the Price Field Office at (435) 636-3614.

Sincerely,

A handwritten signature in black ink, appearing to read "Richard L. Mann".

Field Manager

cc: UT-921, SD, Utah
Utah Division of Oil, Gas and Mining
355 West North Temple Street
3 Triad Center Ste. 350
Salt Lake City, Utah 84180-1203
Joe Wilcox
Office of Surface Mining
Reclamation and Enforcement
1999 Broadway, Suite 3320
Denver, Colorado 80202-5733

Pam

EA for
Horizon Lease
ACT/007/020 #2

3425
UTU-74804
UT-066

DECISION RECORD/FINDING OF NO SIGNIFICANT IMPACT

EA Log No.: UT-066-95-27

Project Name: Beaver Creek
Coal Lease Tract

EA Preparation Date: September 4, 1997

BLM Office: Price River Resource Area

County: Carbon

BLM Office Location: Price, Utah

Phone No.: (801) 636-3600

Applicant: Horizon Coal Corp.

Phone No.: (801) 472-3994

Address: P. O. Box 599
Helper, Utah 84526

EA Preparer: Earthfax Engineerin g, Inc.

Phone No.: (801) 561-1555

Address: 7324 So. Union Park Avenue
Midvale, Utah 84047

RECORD OF DECISION

Decision:

My decision is to recommend holding a lease sale of the Federal coal lease application with the existing standard lease stipulations. The authority for the lease sale is under the Mineral Leasing Act of 1920, as amended.

Rationale:

1. The action is not adverse to local, state or Federal land use plans for the area.
2. The proposed action is in conformance with the Price River Planning Area Management Framework Plan.
3. The proposed action would not cause any significant environmental impacts.
4. The proposed lease tract would provide access to significant coal reserves

adjacent to existing Federal coal leases where mining applications are under way and would avoid potential coal bypass.

Finding of No Significant Impact: Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined that impacts are not expected to be significant and an environmental impact statement is not required.

Richard L. Mannes

Field Manager
Price Field Office

4/2/98

Date

J. William Lamb

State Director
Utah State Office

4/7/98

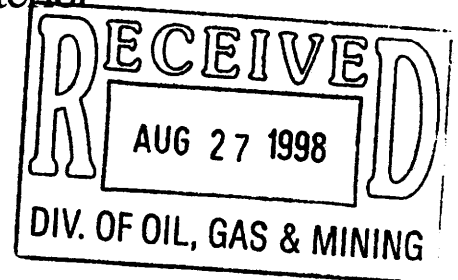
Date



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155



In Reply Refer To:
3425
UTU-74804
(UT-932)

AUG 25 1998

CERTIFIED MAIL--Return Receipt Requested

DECISION

Horizon Mining, LLC
c/o Denise A. Dragoo, Esq.
Van Cott, Bagley, Cornwall & McCarthy
P.O. Box 45340
Salt Lake City, Utah 84145-0340

Coal Lease
UTU-74804

Lease Issued
Bond Accepted

Pursuant to the lease by application sale held May 14, 1998, the bid of Horizon Mining, LLC for the Beaver Creek Tract, assigned serial no. UTU-74804, was determined to be the acceptable high bid. Satisfactory evidence of the qualifications and holdings of Horizon Mining, LLC has been submitted; therefore, coal lease UTU-74804 is hereby issued effective September 1, 1998.

A surety bond of \$257,000 was filed in this office August 21, 1998. The name of the surety is Frontier Insurance Company, and the surety bond no. is 125429. The bond is hereby accepted, as of the date of filing.

ROBERT LOPEZ

Robert Lopez
Group Leader,
Minerals Adjudication Group

Enclosure

Coal Lease UTU-74804

cc: Horizon Mining, LLC (w/encl)
P.O. Box 599
Helper, Utah 84526

bc: Price Coal Office (w/encl)
MMS, Solid Minerals Staff (w/encl)
Resource Development Coordinating Committee (w/encl)
Mr. Lowell Braxton, Director, UDOGM, Box 145801, SLC, UT 84114 (w/encl)

Handwritten notes:
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Daron
ACT/007/020 #2
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#14
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UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial Number

UTU-74804

COAL LEASE

PART I. LEASE RIGHTS GRANTED

This lease, entered into by and between the UNITED STATES OF AMERICA, hereinafter called lessor, through the Bureau of Land Management, and (Name and Address)

Horizon Mining, LLC
P.O. Box 599
Helper, Utah 84526

hereinafter called lessee, is effective (date) 5-1-1993 for a period of 20 years and for so long thereafter as coal is produced in commercial quantities from the leased lands, subject to readjustment of lease terms at the end of the 20th lease year and each 10-year period thereafter.

Sec. 1. This lease is issued pursuant and subject to the terms and provisions of the:

- ☒ Mineral Lands Leasing Act of 1920, Act of February 25, 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;
☐ Mineral Leasing Act for Acquired Lands, Act of August 7, 1947, 61 Stat. 913, 30 U.S.C. 351-359;

and to the regulations and formal orders of the Secretary of the Interior which are now or hereafter in force, when not inconsistent with the express and specific provisions herein.

Sec. 2. Lessor, in consideration of any bonuses, rents, and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants and leases to lessee the exclusive right and privilege to drill for, mine, extract, remove, or otherwise process and dispose of the coal deposits in, upon, or under the following described lands:

T. 13 S., R. 8 E., SLM, UT
Sec. 6, SESW, S2SE, NWSE;
Sec. 7, lots 1-3, E2, E2W2;
Sec. 8, SWNE, NWNW, S2NW,
N2SW, SWSW, W2SE;
Sec. 17, N2NW, SWNE;
Sec. 18, NENE.

U.S. DEPT. OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
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containing 1,288.49 acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and the right to use such on-lease rights-of-way which may be necessary and convenient in the exercise of the rights and privileges granted, subject to the conditions herein provided.

PART II. TERMS AND CONDITIONS

Sec. 1. (a) RENTAL RATE - Lessee shall pay lessor rental annually and in advance for each acre or fraction thereof during the continuance of the lease at the rate of \$ 3.00/acre for each lease year.

(b) RENTAL CREDITS - Rental shall not be credited against either production or advance royalties for any year.

Sec. 2. (a) PRODUCTION ROYALTIES - The royalty shall be 8 percent of the value of the coal as set forth in the regulations. Royalties are due to lessor the final day of the month succeeding the calendar month in which the royalty obligation accrues.

(b) ADVANCE ROYALTIES - Upon request by the lessee, the authorized officer may accept, for a total of not more than 10 years, the payment of advance royalties in lieu of continued operation, consistent with the regulations. The advance royalty shall be based on a percent of the value of a minimum number of tons determined in the manner established by the advance royalty regulations in effect at the time the lessee requests approval to pay advance royalties in lieu of continued operation.

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease bond in the amount of \$ 257,000. The authorized officer may require an increase in this amount when additional coverage is determined appropriate.

Sec. 4. DILIGENCE - This lease is subject to the conditions of diligent development and continued operation, except that these conditions are excused when operations under the lease are interrupted by strikes, the elements, or casualties not attributable to the lessee. The lessor, in the public interest, may suspend the condition of continued operation upon payment of advance royalties in accordance with the regulations in existence at the time of the suspension. Lessee's failure to produce coal in commercial quantities at the end of 10 years shall terminate the lease. Lessee shall submit an operation and reclamation plan pursuant to Section 7 of the Act not later than 3 years after lease issuance.

The lessor reserves the power to assent to or order the suspension of the terms and conditions of this lease in accordance with, inter alia, Section 39 of the Mineral Leasing Act, 30 U.S.C. 209.

Sec. 5. LOGICAL MINING UNIT (LMU) - Either upon approval by the lessor of the lessee's application or at the direction of the lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval will supersede the relevant inconsistent terms of this lease so long as the lease remains committed to the LMU. If the LMU of which this lease is a part is dissolved, the lease shall then be subject to the lease terms which would have been applied if the lease had not been included in an LMU.

Sec. 6. DOCUMENTS, EVIDENCE AND INSPECTION - At such times and in such form as lessor may prescribe, lessee shall furnish detailed statements showing the amounts and quality of all products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

Lessee shall keep open at all reasonable times for the inspection of any duly authorized officer of lessor, the leased premises and all surface and underground improvements, works, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands.

Lessee shall allow lessor access to and copying of documents reasonably necessary to verify lessee compliance with terms and conditions of the lease.

While this lease remains in effect, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Act (5 U.S.C. 552).

Sec. 7. DAMAGES TO PROPERTY AND CONDUCT OF OPERATIONS - Lessee shall comply at its own expense with all reasonable orders of the Secretary, respecting diligent operations, prevention of waste, and protection of other resources.

Lessee shall not conduct exploration operations, other than casual use, without an approved exploration plan. All exploration plans prior to the commencement of mining operations within an approved mining permit area shall be submitted to the authorized officer.

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health, or property, and prevention of waste, damage or degradation to any land, air, water, cultural, biological, visual, and other resources, including mineral deposits and formations of mineral deposits not leased hereunder, and to other land uses or users. Lessee shall take measures deemed necessary by lessor to accomplish the intent of this lease term. Such measures may include, but are not limited to, modification to proposed siting or design of facilities, timing of operations, and specification of interim and final reclamation procedures. Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits not covered hereunder and approving easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of lessee as may be consistent with concepts of multiple use and multiple mineral development.

Sec. 8. PROTECTION OF DIVERSE INTERESTS, AND EQUAL OPPORTUNITY - Lessee shall: pay when due all taxes legally assessed and levied under the laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; restrict the workday to not more than 8 hours in any one day for underground workers, except in emergencies; and take measures necessary to protect the health and safety of the public. No person under the age of 16 years shall be employed in any mine below the surface. To the extent that laws of the State in which the lands are situated are more restrictive than the provisions in this paragraph, then the State laws apply.

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant orders of the Secretary of Labor. Neither lessee nor lessee's subcontractors shall maintain segregated facilities.

Sec. 15. SPECIAL STIPULATIONS -

This coal lease is subject to termination if the lessee is determined at the time of issuance to be in noncompliance with Section 2(a)2(A) of the Mineral Leasing Act.

Sec. 9. (a) TRANSFER

- ☒ This lease may be transferred in whole or in part to any person, association or corporation qualified to hold such lease interest.
- ☐ This lease may be transferred in whole or in part to another public body or to a person who will mine the coal on behalf of, and for the use of, the public body or to a person who for the limited purpose of creating a security interest in favor of a lender agrees to be obligated to mine the coal on behalf of the public body.
- ☐ This lease may only be transferred in whole or in part to another small business qualified under 13 CFR 121.

Transfers of record title, working or royalty interest *must* be approved in accordance with the regulations.

(b) **RELINQUISHMENT** - The lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon lessor's acceptance of the relinquishment, lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

Sec. 10. DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC. - At such time as all portions of this lease are returned to lessor, lessee shall deliver up to lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all workings in condition for suspension or abandonment. Within 180 days thereof, lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the lessor, but lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the lessor. If the surface is owned by third parties, lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by lessee's activity or activities incidental thereto, and reclaim access roads or trails.

Sec. 11. PROCEEDINGS IN CASE OF DEFAULT - If lessee fails to comply with applicable laws, existing regulations, or the terms, conditions and stipulations of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation by the lessor only by judicial proceedings. This provision shall not be construed to prevent the exercise by lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time.

Sec. 12. HEIRS AND SUCCESSORS-IN-INTEREST - Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

Sec. 13. INDEMNIFICATION - Lessee shall indemnify and hold harmless the United States from any and all claims arising out of the lessee's activities and operations under this lease.

Sec. 14. SPECIAL STATUTES - This lease is subject to the Clean Water Act (33 U.S.C. 1252 et. seq.), the Clean Air Act (42 U.S.C. 4274 et. seq.), and to all other applicable laws pertaining to exploration activities, mining operations and reclamation, including the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et. seq.).

SEE ATTACHED STIPULATIONS

THE UNITED STATES OF AMERICA

Horizon Mining, LLC
Company or Lessee Name

[Signature]
(Signature of Lessee)

Manager
(Title)

7-25-98
(Date)

By

[Signature]
(Signature of Officer)
Group Leader
Minerals Adjudication Group
(Title)

AUG 25 1998
(Date)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

This form does not constitute an information collection as defined by 44 U.S.C. 3502 and therefore does not require OMB approval.

BLM STIPULATIONS

The following stipulations made part of this lease may be waived or amended with the mutual consent of the lessor and lessee.

1. In accordance with Sec. 523(b) of the "Surface Mining Control and Reclamation Act of 1977," surface mining and reclamation operations conducted on this lease are to conform with the requirements of this act and are subject to compliance with Office of Surface Mining regulations, or as applicable, a Utah program equivalent approved under cooperative agreement in accordance with Sec. 523(c). The United States Government does not warrant that the entire tract will be susceptible to mining.

2. The permitting of any mining operations on the lease will be subject to the possible designation of any portion of the lease as unsuitable for some or all kinds of surface mining under the regulations of the Department under the Surface Mining Control and Reclamation Act of 1977 (SMCRA) in effect at the time of action on the mine plan permit.

3. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a cultural resource inventory of the areas to be disturbed. These studies shall be conducted by qualified professional cultural resource specialists and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified cultural resources.

If significant cultural resources are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the authorized officer who shall evaluate or have evaluated such discoveries and, within 5 working days, shall notify the lessee what action shall be taken with respect to such discoveries.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measures shall be borne by the lessee.

4. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a paleontological appraisal of the areas to be disturbed. The appraisal shall be conducted by qualified paleontologists and a report prepared itemizing the findings. A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified paleontological resources.

If paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the authorized officer who shall evaluate or have evaluated such discoveries brought to his attention and, within 5 working days, shall notify the lessee what action shall be taken with respect to such discoveries. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground mining operations.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measures shall be borne by the lessee. The cost of salvage of paleontological remains (fossils) shall be borne by the United States.

5. If there is reason to believe that threatened or endangered (T&E) species of plants or animals, or migratory species of high Federal interest occur in the area, the lessee shall be required to conduct an intensive field inventory of the area to be disturbed and/or impacted. A listing of migratory birds of high Federal interest in Federal coal producing regions is published by the Fish and Wildlife Service, Migratory Bird Management Office, Washington, D.C. The inventory shall be conducted by qualified specialist and a report of findings will be prepared. A plan will be prepared making recommendations for the protection of these species or action necessary to mitigate the disturbance.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measures shall be borne by the lessee.

6. The lessee shall be required to perform a study to secure adequate baseline data to quantify the existing surface resources on and adjacent to the lease area. Existing data may be used if such data is adequate for the intended purposes. The study shall be adequate to locate, quantify, and demonstrate the inter-relationship of the geology, topography, surface hydrology, vegetation, and wildlife. Baseline data will be established so that future programs of observation can be incorporated at regular intervals for comparison.

7. Powerlines on the lease area used in conjunction with the mining of coal from this lease shall be constructed so as to provide adequate protection for raptors and other large birds. When feasible, powerlines will be located at least 100 yards from public roads.

8. The lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal handling and storage facilities on the lease area. The migration of road surfacing and subsurface materials into streams and water courses shall be prevented.

9. The lessee shall be required to establish a monitoring system to locate, measure, and quantify the progressive and final effects of underground mining activities on the topographic surface, underground and surface hydrology and vegetation. The monitoring system shall utilize techniques which will provide a continuing record of change over time and an analytical method for location and measurement of a number of points over the lease area. The monitoring shall incorporate and be an extension of the baseline data.

10. Except at specifically approved locations, underground mining operations shall be conducted in such a manner so as to prevent surface subsidence that would: 1) cause the creation of hazardous conditions such as potential escarpment failure and landslides, 2) cause damage to existing surface structures, or 3) damage or alter the flow of perennial streams.

11. In order to avoid surface disturbance on steep canyon slopes and to satisfy the need for surface access, all surface breakouts for ventilation tunnels shall be constructed from inside the mine, except at specifically approved locations.

12. Support facilities, structures, equipment, and similar developments will be removed from the lease area within 2 years after the final termination of use of such facilities. This provision shall apply unless the requirement of Section 10 of the lease form is applicable. Disturbed areas and those areas occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to a premining land use.

13. Notwithstanding the approval of a resource recovery and protection plan by the BLM, lessor reserves the right to seek damages against the operator/lessee in the event (i) the operator/lessee fails to achieve maximum economic recovery [as defined at 43 CFR §3480.0-5(21)] of the recoverable coal reserves or (ii) the operator/lessee is determined to have caused a wasting of recoverable coal reserves. Damages shall be measured on the basis of the royalty that would have been payable on the wasted or unrecovered coal.

The parties recognize that under an approved R2P2, conditions may require a modification by the operator/lessee of that plan. In the event a coal bed or portion thereof is not to be mined or is rendered unminable by the operation, the operator shall submit appropriate justification to obtain approval by the AO to leave such reserves unmined. Upon approval by the AO, such coal beds or portions thereof shall not be subject to damages as described above. Further, nothing in this section shall prevent the operator/lessee from exercising its right to relinquish all or a portion of the lease as authorized by statute and regulation.

In the event the AO determines that the R2P2 as approved will not attain MER as the result of changed conditions, the AO will give proper notice to the operator/lessee as required under applicable regulations. The AO will order a modification if necessary, identifying additional reserves to be mined in order to attain MER. Upon a final administrative or judicial ruling upholding such an ordered modification, any reserves left unmined (wasted) under that plan will be subject to damages as described in the first paragraph under this section.

Subject to the right to appeal hereinafter set forth, payment of the value of the royalty on such unmined recoverable coal reserves shall become due and payable upon determination by the AO that the coal reserves have been rendered unminable or at such time that the lessee has demonstrated an unwillingness to extract the coal.

The BLM may enforce this provision either by issuing a written decision requiring payment of the MMS demand for such royalties, or by issuing a notice of non-compliance. A decision or notice of non-compliance issued by the lessor that payment is due under this stipulation is appealable as allowed by law.

14. **WASTE CERTIFICATION:** The lessee shall provide on a yearly basis and prior to lease relinquishment, certification to the lessor that, based upon a complete search of all the operator's records for the mine and upon their knowledge of past operations, there has been no **hazardous substances** per (40 CFR 302.4) or **used oil** as per Utah State Management Rule R-315-15, deposited within the lease, either on the surface or underground, or that all remedial action necessary has been taken to protect human health and the environment with respect to any such substances remaining on the property. The back-up documentation to be provided shall be described by the lessor prior to the first certification and shall include all documentation applicable to the Emergency Planning and Community Right-to-know Act (EPCRA, Public Law 99-499), Title III of the Superfund Amendments and Reauthorization Act of 1986 or equivalent.

15. **UNDERGROUND INSPECTION:** All safe and accessible areas shall be inspected prior to being sealed. The lessee shall notify the Authorized Officer in writing 30 days prior to the sealing of any areas in the mine and state the reason for closure. Prior to seals being put in place, the lessee shall inspect the area and document any equipment/machinery, hazardous substances, and used oil that is to be left underground. The Authorized Officer may participate in this inspection. The purpose of this inspection will be: (1) to provide documentation for compliance with 42 U.S.C. 9620 section 120(h) and State Management Rule R-315-15, and to assure that certification will be meaningful at the time of lease relinquishment, (2) to document the inspection with a mine map showing location of equipment/machinery (model, type of fluid, amount remaining, batteries etc.) that is proposed to be left underground. In addition, these items will be photographed at the lessee's expense and shall be submitted to the Authorized Officer as part of the certification. The abandonment of any equipment/machinery shall be on a case by case basis and shall not be accomplished unless the Authorized Officer has granted a written approval.